Magnetic nanoparticles leap from lab bench to breast cancer clinical trials

Longstanding Sandia, industry collaboration produces precise particles

By Mollie Rappe

Dale Huber has been working on the challenge of making iron-based nanoparticles the exact same size for 15 years. His long-term collaborators at Imagion Biosystems will use these magnetic nanoparticles for their first breast cancer clinical trial later this year. The nanoparticles — so small 3 billion of them would fit on the head of a pin with room to spare — stick to breast cancer cells, allowing the detection and removal of even small metastases.

Imagion Biosystems and Dale have been working together synthesizing nanoparticles since the opening of the Center for Integrated Nanotechnologies in 2006. Having access to the talent pool at CINT with experts like Dale Huber has been helpful,” said Bob Proulx, CEO of Imagion Biosystems. “Additionally, the fact that CINT has a user program that allows industry to access the facilities and equipment that, otherwise, would be too expensive for a small company like ours was valuable. The initial work we did with CINT to develop a method to give precise control over the size of the nanoparticle was key for our MagSense magnetic relaxometry technology for the detection of cancer.”

CINT is a user facility jointly operated by Sandia and Los Alamos National Laboratory for the U.S. DOE’s Office of Science. CINT provides free access to state-of-

Exploring Arctic clues to secure future with new Sandia, university partnership

By Kristen Meub

The Arctic is undergoing rapid change, with sea ice melting and temperatures rising at a faster pace than anywhere else in the world. Its changing environment affects global security, politics, the economy and the climate.

Understanding these changes is crucial for shaping and safeguarding U.S. security in the future, says Sandia scientist Parrott, Sandia atmospheric sciences manager.

“For the last 40 to 50 years, the Arctic environment has been changing at twice the pace of what’s happening globally, and during the last 20 years, it’s accelerated to three times the pace,” Parrott said. “Those changes don’t stop in the Arctic. Historically, when we’ve had more opening of ocean systems in the Atlantic and the Pacific, major change and shifts in socio-economic and political power have happened around the globe, and we wouldn’t necessarily expect the Arctic to be different.”

The agreement runs the gamut of projects, from working toward a comprehensive multi-agency research facility that tackles overarching Arctic issues, supporting Alaskan resilience against natural disasters and the harsh environment, studying the suitability of renewable energy and microgrids for the Arctic environment, flying tethered balloons and drones to measure atmospheric temperatures and collaborating on satellite sensing, detection and nonproliferation work.

“There are a lot of concerns in science, security and energy stability where Sandia’s capabilities are complementary or distinct from UAF’s, and this partnership is an opportunity for us to help the U.S. manage the risks and responsibilities that come with the changes in the Arctic,” said Lori Parrott, Sandia atmospheric sciences manager.

“The opening up of sea ice is going to lead to concerns for border security. As a country, we must consider how to ensure that our fourth coast is as secure as our other coasts.”

Sandia manages two facilities at sites on the North Slope of Alaska as part of the Atmospheric Radiation Measurement program, a national scientific user facility funded through the DOE’s Office of Science. Sandia also manages two areas of (Continued on page 4)

Wind blade from a 3D-printed mold, energy-saving nanoparticles earn Sandia national FLC awards

See page 3
Editor’s Note: Lab News continues to seek guest columnists with observations on life at the Labs or on science and technology in the news and in contemporary life. If you have a column (500-750 words) or an idea you’d like to submit, please contact Jim Danneskiold, the acting editor.

By Cathy Ann Connelly

If you’re reading this, you possess great power and opportunity — simply because you can read.

A small, relatively young local nonprofit, Reading Works (www.reading-works.org), is effectively chipping away at tutoring the more than 100,000 adults in the Albuquerque area who are functionally illiterate — empowering them with reading skills so they, and their families, can have different, broader, more stable life opportunities. “Functionally illiterate” basically means lacking the literacy necessary for coping with most jobs and everyday situations.

A year ago I started tutoring adult learners through Reading Works. And, while I anticipated I’d get some satisfaction through volunteering, I was not prepared for what I actually received.

I’ve learned about a shared excitement in each modest achievement and “ah ha” moment I see in a learner’s eyes. About being thankful for whatever you have, and wherever you are in your life. My students help me check my expectations at the door, to be present and mindful in adapting how I try to help and where we go with lessons. They remind me to never give up, and to be happy in the ability to show up and celebrate improvement, not perfection.

I stepped into this Reading Works journey because in today’s world, in this great nation, I cannot imagine being unable to read and not having somewhere to go and someone to help with this fundamental life skill. I also felt that our national environment recently has had too many hands up, trying to stop people’s life progress — and I wished to counterbalance that trend, even if I’m just one person helping one student.

Reading Works’ “12 Weeks to Reading” program is a phoneme (sound)-based approach that helps adults who, for a variety of reasons, never got the extra help they needed to read. It just won a prestigious Library of Congress literacy award, and is now finding funding to print and share its program materials with other groups, to reach more adult learners.

They rigorously screen tutors and students. And they carefully match them, and help them connect and get acquainted. Tutors don’t need previous teaching experience, but need to be reflective, willing to help others, but also willing to learn than tutoring reading, if that’s not a fit, such as English as a Second Language, math, science and computer help, tutoring for GEDs and administrative or fundraising assistance.

Training to become a reading tutor takes half a day, and requires a six-month commitment. Reading Works offers follow-up training, and back up tutors with great office staff, other volunteers, and an office full of helpful resource materials. Tutors and learners decide when and where they meet each week for four-hour two-hour tutoring sessions, and Reading Works provides guidance on recommended locations.

One reason they’ve received Sandia and United Way Community Campaign support is their attention to collecting meaningful metrics on their work.

Reading Works qualifies as one of the programs helping not only adult learners, but improving Albuquerque-area family stability. As a Sandian, I designate them to receive my annual UW contribution. Eighty-two cents from each Reading Works dollar goes directly to support their students and tutoring programs in the field. They served 193 students in fiscal year 2016-17. They do a lot with what they get.

Sandia Community Involvement is featuring Reading Works on its website in May, and it’s featured in other ways around the Labs. Through May 11, Reading Works also is part of USA Today’s social fundraising www.crowdrise.com campaign, where giving as little as $10 potentially can qualify the literacy program for as much as $25,000 in grants.

I’ve each of you and all that have already do to positively contribute to our Albuquerque community. I hope those of you with any extra time and resources will consider assisting Reading Works and help empower adults to read.

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How has Reading Works improved my life

by Liu Sha

Reading Works tutor Camilla Haneberg (left) and learner Liu Sha who are participants in the adult literacy program. Liu wrote the guest article, “How has Reading Works improved my life” which appeared in the nonprofit’s “New Words” newsletter and is reprinted here with the permission of Reading Works, Camilla and Liu. Liu refers to “Cindy” and “Esodie,” who are the two staff members who keep Reading Works’ office running.

Note: Text is reprinted as it appeared in Reading Works’ monthly publication.

Even I’ve been Albuquerque for 3 years, My listening and speaking are good. My husband and my friends in here are Chinese, so I don’t have many chance to speak English. You know if you want to improve your English you must talk to English speak-er. I’m lucky! In the end of this year, my friend introduced Reading Works to me. I’m very nervous when I first went to Reading Works, but it never hap-pened again, because Cindy and Esodie are very nice and patient. Esodie find a wonderful teacher ‘Camilla’ for me specially. Camilla not only good at teach but also has many common ground with me. We are libra and we both like art. We went to Asian market and art museum together. We had a lot of conversation. I have so many time to open my mouth. It’s very happy for my study. I can see so much improvement with my pronunciation and comfort with talk. Happily, we’re good friends now.

Thanks, Reading Works.

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Lab News Notes

"A Sandia National Laboratories Department of Energy’s National Nuclear Security Administration under a wholly owned subsidiary of Honeywell International, Inc., for the U.S. operated by National Technology and Engineering Solutions of Sandia, LLC., Mollie Rappe (844-8220), Kristen Meub (845-7215), Michael Espodie find a wonderful teacher ‘Camilla’ for me specially. Camilla not only good at teach but also has many common ground with me. We are libra and we both like art. We went to Asian market and art museum together. We had a lot of conversation. I have so many time to open my mouth. It’s very happy for my study. I can see so much improvement with my pronunciation and comfort with talk. Happily, we’re good friends now.

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Thanks, Reading Works.
First wind blade from a 3-D printed mold, energy-saving nanoparticles earn Sandia national FLC awards

Sandia National Laboratories has won the Federal Laboratory Consortium for Technology Transfer’s (FLC) national 2018 Technology Focus Award for designing the first wind turbine blades ever fabricated from a 3-D printed mold, which could dramatically shorten the time and expense of developing new wind energy technology.

The labs also won an Excellence in Technology Transfer Award for advanced nanomaterial window films that could save consumers billions in energy costs each year.

“These two deserving collaborations align well with Sandia’s mission,” said Jackie Kerby Moore, manager of Technology and Economic Development and the labs’ representative to the FLC. “They strengthen our nation’s energy security and resilience by lowering the cost of energy technologies.” The winners were honored at an award ceremony April 25 at the consortium’s National Meeting in Philadelphia, Pennsylvania.

3-D printing accelerates wind tech innovation

For four decades, Sandia researchers have designed wind turbines that capture energy more efficiently than prevailing technology and so drive down the cost of renewable energy. But producing prototypes is a drag. Each requires a series of labor-intensive, custom molds that can take up to 16 months to complete before the blade can be built and tested.

Sandia led a partnership that demonstrated a way to reduce this time to just three months. Teaming with Oak Ridge National Laboratory, a leader in the field of 3-D printing, and TPI Composites, the nation’s largest independent manufacturer of wind turbine blades, Sandia 3-D printed the mold directly from a digital design, slashing more than a year from production time. The demonstration focused on a relatively small 13-meter blade, but if applied at larger scales in industry, designers could take more risks with experimental designs and accelerate innovation in wind technologies.

The FLC’s 2018 Technology Focus Award honors Sandia’s collaborative effort to address a pressing energy-related challenge. Sandia led the design of the blade, including an assessment of the feasibility of using additive manufacturing. TPI consulted on the mechanical parameters and performed the structural design and Computer aided Design geometry required to successfully mold the blade. Oak Ridge printed the mold in several sections in just two weeks, with the final assembly and manufacturing of the blade at TPI. “The wind department at Sandia has expertise in designing blades, but our group doesn’t work with additive manufacturing,” Sandia investigator Josh Paquette said. “This project was an opportunity to combine expertise from two laboratories and an industry adviser that could immediately bring this knowledge into the private sector.”

The Federal Laboratory Consortium for Technology Transfer is a nationwide network of more than 300 members that provides a forum to develop strategies and opportunities for linking laboratory mission technologies and expertise with the marketplace. The FLC’s Awards Program annually recognizes federal laboratories and their industry partners for outstanding technology transfer efforts. Since its establishment in 1984 the organization has presented awards to nearly 200 federal laboratories, becoming one of the most prestigious honors in technology transfer.
Nanoparticles (Continued from page 1)

The magnetic nanoparticles are coated with cancer antibodies, which stick specifically to cancerous cells. A tiny magnetic pulse — about the strength of a refrigerator magnet and hundreds of times weaker than one produced by an MRI machine — can sense the difference between nanoparticles stuck to cancer cells and those that are floating freely, allowing the detection of very small metastases.

Precision synthesis of magnetic nanoparticles

However, for Imagion Biosystems’ cancer detection method to work, all the nanoparticles have to be almost exactly the same size.

"A 2 percent variation is the difference between perfect and just about useless," said Dale. He added laughing, "It was eye opening for me and I had known that in the beginning, I might not have taken on the challenge."

Erika Vreeland, who worked with Dale during her doctoral theses to develop reproducible synthesis and was hired by Imagion Biosystems to be their chief nanoparticle scientist after the graduate, said, “We eliminated all of the witchcraft of the reaction.”

The standard method to make iron nanoparticles is to mix the ingredients and heat the mixture to about 650 degrees Fahrenheit. How quickly the heat increases determines the nanoparticle size, said Dale. However, just like your oven at home, it will overshoot the critical temperature and then cool down until it levels off. How much the temperature overshoots this critical temperature also affects the size, producing nanoparticles more than 15 percent larger or smaller.

Instead, Dale and Vreeland developed a method where they slowly add the ingredients to a molten metal bath whose temperature varies less than half a degree. This produces nanoparticles with less than 2 percent size variation. Dale said, “It’s not the easiest way to make particles, but that’s why they’re so much better.”

Not only did the team discover a highly reproducible method to make the tiny particles, they also transferred the process twice — once to Imagion and once to ChemConnection, a nanoparticle manufacturer in the Netherlands that can make the nanoparticles under the strict U.S. Food and Drug Administration and European Union regulations needed for use in patient clinical trials.

"The synthesis was transferred to the lab in the Netherlands while maintaining size control," said Dale. "This is huge. Everything changes, even the boiling points, because the Netherlands is basically at sea level."

Clinical trial to detect spread of breast cancer this fall

After ChemConnection makes several batches, Imagion Biosystems will perform some preclinical trials to double-check the particles aren’t toxic. Then ChemConnection will make a small production lot of nanoparticles — comparable to a half teaspoon of sugar — for Imagion Biosystems’ breast cancer clinical trials.

"Because the nanoparticles are uniform and have excellent magnetic properties, we don’t need a lot. We expect that a patient will be injected with at most 1 milligram of particles," said Vreeland.

All of the patients for the first clinical trial will be selected because their oncologists’ treatment regimes include lymph node removal and biopsy. Before each patient has several lymph nodes removed surgically, the magnetic nanoparticles, coated in the breast cancer-specific antibodies, will be injected at the site of the known tumor. After the removal but before the biopsy, Imagion Biosystems’ detection system will examine removed lymph nodes to look for the spread of cancer.

"Our No. 1 aspiration is to see the nanoparticles make it into regular clinical use with our MagDense cancer detection technology. Beyond that we believe the nanoparticles can be instrumental in a wide variety of biomedical applications including uses in treatment of cancer or other diseases," said Prouds.

Continuing collaboration to characterize nanoparticles and solve problems

CINT and Imagion Biosystems continued the collaboration beyond the effort to produce identically sized magnetic nanoparticles. Vreeland said, “We still run into all sorts of issues all the time so being able to talk with Dale or other scientists about some of the challenges we’re facing is really invaluable.”

Sandra bioengineer George Bachand assisted with the early toxicology and cell-targeting studies. Sandia researcher John Reno helped characterize the size and shape of the nanoparticles, using small angle X-ray scattering.

Small angle X-ray scattering is a method to determine the size and size distribution of nanoscale materials. "With CINT’s X-ray scattering instrument we can figure out exactly how big the particles are in 15 minutes. Seven or eight years ago it would take a week to figure out the same thing using electron microscopy," said Dale. This almost real-time size measurement enabled Vreeland to predict how the reaction would end and validate that they were on the right path, she said. The team used other CINT instruments to characterize the magnetic strength and coatings of the nanoparticles.

In addition to accessing the CINT experts and equipment through its user program, the partnership with Imagion Biosystems was supported by several New Mexico Small Business Assistance Program grants, which can support proprietary research. The team also emphasized the collaboration including one in Chemistry of Materials in 2015.

Arctic clues (Continued from page 1)

controlled airspace from the Alaska north coast toward the North Pole on behalf of the DOE, which provides opportunities for scientific testing and technology evaluation over the Arctic Ocean. The UAF, a public university, does extensive research on such Arctic issues as permafrost, coastal erosion, sea ice, search and rescue operations, glaciers, remote energy systems and more. The university’s Geophysical Institute contains the Alaska Center for Unmanned Aircraft Systems Integration, a research center that develops, tests and ultimately exploits emerging unmanned aircraft technology and its uses, with a special emphasis on the Arctic and sub-Arctic regions.

“We have a shared interest in the Arctic and Arctic science,” said Nettie LaBelle-Hamer, a University of Alaska Fairbanks researcher. “It’s part of our DNA here at UAF. Arctic-related science and infrastructure collaboration on the researcher level have been pretty successful between Sandia and UAF over the years, and this CINT/KCMA is helping us grow that. We have a lot in common, and as projects move forward, we’ll be better together.”

The partnership is in early stages, but work has already begun on a variety of projects:

• Comprehensive Arctic research facility: Many agencies have Arctic research facilities that focus on their specific needs and operations, but there is no collabora-
tive research facility that addresses complex, over-
arching Arctic issues and brings together private and public agencies. Sandia and the UAF are working with other organizations to plan and build support for a joint facility, similar in concept to existing stations in the Antarctic.

• Arctic resilience: Climate change, permafrost thaw, melting sea ice, ice jams, earthquakes, tsunamis and harsh conditions all pose a threat to remote Arctic commu-
nities, industry and infrastructure. The University of Alaska Fairbanks is leading a project to develop an Ar-
cctic computer modeling, simulation and analysis pro-
gram similar to the National Infrastructure Simulation and Analysis Center that includes Sandia. The center studies infrastructure and models how it responds to

natural disasters, environmental impact and other
threats to help make remote systems and communities more resilient.

• Energy research: Sandia and the university are researching how emerging renewable energy and grid-integration technologies perform in remote parts of Alaska that experience harsh Arctic conditions, including
temperature cycles, grid power quality issues and geomagnetic disturbances. Abraham Ellis, a Sandia photovoltaic systems manager, said, “Access to affordable and resilient electricity is a challenge for many Alaska communities, and that harsh environment provides a

realistic proving ground for new energy technolo-
gies, such as advanced power electronics and resilient systems, that will eventually have to be applied to the rest of the grid.” UAF has also been active in this area with the Alaska Center for Energy and Power.

The new partnership between Sandia and the UAF will be discussed at Alaska National Lab Day May 30-31 in Fairbanks. The event will feature a variety of speakers from the Department of Energy’s national laboratories, plus Alaska academia and industry. The event will high-
light partnerships and opportunity for collaboration on national security, science and energy research.
Partnerships, networking and collaboration

By Michael J. Baker

Juggling pins in the air


As we are at our desk. We are by our phone. We live with our email. So, a lot of people will call the administrative assistant first,” says Sandra Jinon, an office administrative assistant who has experienced more than a few mornings and afternoons juggling schedules, rooms, meetings and other tasks since she started at Sandia in 2005.

“The more people in your network, the more successful at the Labs, says Amanda Espinoza, a senior management assistant in project management planning and control standards. “The relationship between management and their administrative professionals is behind the Administrative Professionals Executive Council, which consists of all 12 executive assistants. Each division is represented by its EA during APEC monthly meetings. The role of APEC is to allow teamwork ‘in support of Sandia’s executives, facilitate communication and collectively engage to help develop and sustain effective and efficient operational practices and a robust administrative professional workforce,’ according to its charter.

Teamwork makes the dream work

The relationship between management and their administrative professionals demands that everyone work as a team to fully reach their potential. "To be successful, a manager must see the admin as part of the team," says Pauline Martinique, executive assistant for Human Resources and Communications. "It's not just someone to give tasks to, Pauline says. "To push forward, both jobs must be cohesive." The key is several ways to make administrative professionals integral to the Labs’ work: including them in department or project meetings; introducing them to visitors and customers; and, in general making it clear they are peers and respected members of the team.

"My manager is amazing, and we work well together as a team," says Casey Krill, administrative staff assistant for quality assurance. "I love being part of this team and working with everyone. We have an amazing team," says Deb Marchand, the administrative assistant to Labs Director Steve Younger. "I feel strongly the admins are the backbone of the Labs. The support is essential to the Labs' mission. We have an amazing team," says Deb Marchand, the administrative assistant to Labs Director Steve Younger. "I feel strongly the admins are the backbone of the Labs. The support is essential to the Labs' mission. We have an amazing team," says Deb Marchand, the administrative assistant to Labs Director Steve Younger. "I feel strongly the admins are the backbone of the Labs. The support is essential to the Labs' mission. We have an amazing team," says Deb Marchand, the administrative assistant to Labs Director Steve Younger.

Sandra Jiron collaborates with teammates as part of her duties as an office administrative assistant. (Photo by Randy Montoya)

SANDIA LABS PRODUCER BRENT PETERSON

(603) 528-2992

By Manette Newbold Fisher

For Sandia producer Brent Peterson, directing the 2017 ethics films was a project of passion that came down to complex stories and relatable characters, with a goal of curbing the eye rolls that corporate training videos sometimes generate. The result? Short films that were praised within the Labs and garnered national accolades.

“’Get Your Head in the Game’ involves a new employee who decides working faster will be better for his career than working with a mentor and learning the rules. ‘Out of Bounds’ is about a manager who uses corporate resources for personal volunteer work outside of the Labs. ‘The Missing’ tells a story about employees who fail to check orders correctly, resulting in potential loss of a big customer and increased costs. Peterson wanted to tell stories that didn’t have concrete answers.

“The ability to share information, collaborate and promote the interests of Sandia administrative professionals is behind the Administrative Professionals Executive Council, which consists of all 12 executive assistants. Each division is represented by its EA during APEC monthly meetings. The role of APEC is to allow teamwork 'in support of Sandia’s executives, facilitate communication and collectively engage to help develop and sustain effective and efficient operational practices and a robust administrative professional workforce,' according to its charter.

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For Sandia producer Brent Peterson(365,278),(650,423)

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Sandra Jiron collaborates with teammates as part of her duties as an office administrative assistant. (Photo by Randy Montoya)
Sandia measurements expert named Asian American Engineer of the Year

By Lindsey Kibler

Sandia National Laboratories senior scientist Hy Tran has been named a 2018 Asian American Engineer of the Year. The award program is sponsored by the Chinese Institute of Engineers-USA to salute Asian-American professionals in science, technology, engineering and math who demonstrate exceptional leadership, technical achievements and public service.

“I am deeply both humbled and honored to have been nominated by Sandia and selected by CIE-USA,” Hy said of his selection. “This is not so much a personal honor. This honor belongs to Sandia National Laboratories.”

He also credits “the supportive environment and great leadership” within the labs, along with the hard work of colleagues and collaborators, technicians, and support staff, including computer, administrative and safety staff. “They make my day job easy,” he said.

A career in measured science

Hy began working in Sandia’s Primary Standards Laboratory in 2004 and, the following year, was selected as project lead for length, mass, and force metrology, which is the science of measurement. Hy promoted best measurement practices at the National Nuclear Security Administration Laboratories, and established and maintained a research and development program in measurement science, supporting the calibration needs of the nuclear security enterprise.

Hy and his team won an R&D 100 award for his development of a three-dimensional micro-machined calibration reference standard that improves measurement accuracy in Mesoscale Measurement Machines used for high-volume parts manufacturing. His calibration reference standard is 10 times more accurate and less expensive than its predecessor, and can be used in the manufacture of miniaturized devices such as fuel injectors, watch components and inkjet printers.

In 2010, Hy was appointed to distinguished member of the technical staff and five years later to senior scientist, a title conferred on no more than one percent of them. In 2016, Hy was elected an American Society of Mechanical Engineers fellow.

Today, Hy works to develop and implement research and development strategies for the Primary Standards Lab. He also is chair of a Sandia committee that identifies small or short-term research projects across the labs to help ascertain how to turn them into larger research and development efforts. This effort is funded by Laboratory Directed Research and Development.

“Professionally, I still can’t believe that I was appointed to senior scientist — there are fewer than 50 senior scientists at Sandia,” said Hy. “I am incredibly proud of being asked to serve on the LDRD exploratory express committee, and being asked to chair the committee in October 2017. These small projects are the seeds of Sandia’s future. We intentionally mentor early career staff in the committee, so not only are we nurturing new technical ideas and directions, but we are also nurturing our future leading scientists and engineers.”

The committee has funded more than 140 individual research projects since 2013, with 39 of those projects funded since he became chair.

A growing interest in science, engineering and public service

Born in Vietnam, he says his family was very fortunate to emigrate to the United States during the Vietnam War. They settled in Virginia in 1970. He developed an interest in science, engineering and public service from his family; his father was a physician and his mother a midwife.

“Engineers are always seeking to improve things, so the values of education, hard work and service have all played into making me an engineer, and in the various roles that I have served as an engineer,” he said.

Hy earned bachelor’s degrees in science and in mechanical engineering from the Massachusetts Institute of Technology. He received his master’s in mechanical engineering, and his doctorate in mechanical engineering, with a minor in electrical engineering, from Stanford University.

Serving the community through education

Before coming to Sandia, Hy was an assistant professor of mechanical engineering at the University of New Mexico and a doctoral advisor for students both in mechanical engineering and in electrical and computer engineering. In addition, Hy has dedicated many years to volunteering, typically in activities that involve educational outreach. He has helped demonstrate scientific research and organize chess clubs at local schools and has prepared teams for the Albuquerque Scholastic Chess League competitions.

Hy’s science outreach activities led him to join the New Mexico Partnership for Math and Science Education and, in 2013, the New Mexico secretary of education appointed him to serve a four-year term as a member of the Math and Science Advisory Council to advise the New Mexico Public Education Department on the performance of K-12 students studying science, technology, engineering and mathematics.

An amateur woodturner, Hy helps organize and teach a woodturning class for middle school students at Explora, an Albuquerque science museum, alongside fellow Sandian Aaron Hall. The class provides an opportunity to combine a few of his favorite things — science, volunteering and woodturning, he said.

“I would advise anyone looking to get into science and engineering: Be passionate about learning — you can learn something from any experience and activity, not just classroom,” Hy said. “The breadth of your knowledge is one source of creativity, so broaden your formal education. Use your electives to go outside the boundaries of your discipline.”

Hy was honored April 7, during the annual Asian American Engineer of the Year recognition event in Albuquerque.

Sixteen Sandia engineers have earned an Asian American Engineer of the Year award. Nominees come from a range of industrial, academic, government and scientific institutions, and other past winners include astronauts, corporate executives and Nobel laureates. The institute notes that “many of [the recipients’] achievements represent monumental breakthroughs in their respective fields and their impacts are global and everlasting.”
83 Sandians move into Senior, Distinguished ranks

Sandia’s special appointments represent employees from all areas of the Labs’ operations. According to Corporate Policy System documentation, placement in the Distinguished level signifies a promotion to the fourth level of the job. This level is populated with a select group of exceptional employees who have distinguished themselves in their careers while at Sandia. It is different from the other levels in that it is subject to a 10 percent population limit to preserve the distinction of the level. Divisions are not obligated to fill all the distinguished “slots.” Employees selected for the new levels have been recognized with a special plaque and a nonbase salary award, in addition to this special mention in the Lab News. Also pictured here are individuals appointed to the very select title of senior scientist/engineer or senior administrator, a unique recognition of professional accomplishment.

Not Pictured: Bart Chavez, Electo-mechanical Technologist; Ann Laney Smith, Intelligence and Counterintelligence Professional

Senior Scientist/Engineer

Igal Brener
Optical Engineering
Devin Mitchell
Nuclear Engineering
Harold Radloff
Mechanical Engineering

Jonathan Rogers
Systems Research and Analysis
Joseph Sanders
Mechanical Engineering
Scott Strong
Computer Engineering

Bertice Tise
Computer Engineering
Robert Waters
Systems Engineering
Douglas Weiss
Electrical Engineering

Senior Administrator

Beth Dick
Quality Assurance Specialist

Division 3000

Peter Heald
Training and Development Designer
Don Shoemaker
Human Resources Business Partner

Division 1000

Jerome Cap
Mechanical Engineering
Mathias Celina
Materials Science
Karen Devine
Computer Science
Michael Gallis
Mechanical Engineering

Jim Nakos
Mechanical Engineering
Edward Parma
Nuclear Engineering
Shawn Pautz
Computer Science
Patrick Rambo
Optical Engineering
Mark Taylor
Computer Science
By Jules Bernstein

When it comes to promoting entrepreneurship and innovative technologies, Sandia stands out. That’s according to the Innovation Tri-Valley Leadership Group (ITVLG), which has honored the Labs with its prestigious 2018 Founders Award.

The group acknowledged Sandia as a pioneer in bringing new technologies to market and fostering a competitive business climate in the cities of Livermore, Dublin, Pleasanton, San Ramon and Danville. Group CEO Dale Kaye said Sandia’s transferring of “lab technologies to both startups and established businesses is key to our local innovation ecosystem.”

Specifically, the award recognizes Sandia’s work with the Livermore Valley Open Campus, an expanding village of research centers on the border of Sandia and Lawrence Livermore National Lab that cultivates collaboration between the labs, industry and academia. Current areas of focus on the campus include transportation energy, cybersecurity, biocience and advanced manufacturing.

Mutual admiration society

Biological and Materials Science Center Director Anup Prakash thanked the Leadership Group during its third annual #GameChangers award ceremony on April 10. In his remarks, Anup explained why Sandia, along with a handful of other community leaders, helped start ITVLG in 2011.

Sandia saw the potential in a regional organization dedicated to amplifying innovation assets,” Anup said. “We knew it could help attract the talent and collaborators that would enable us to be successful in our national security mission – and it has.”

Stephanie Beadis, Sandia’s partnership officer, agreed that Sandia’s investment in the group has paid off. “Through the leadership of this organization, businesses in the Tri-Valley are connecting and thriving,” she said.

Statistics punctuate Stephanie’s point. According to Crunchbase data, there are an estimated 450 tech companies based in the region. They’ve collectively raised $1 billion in capital since 2015, and the median value of local companies acquired since 2010 is $75 million. And while San Francisco saw 3 percent employment growth between 2000 and 2012, the Bay Area Council Economic Institute reports the Tri-Valley area enjoyed nearly 21 percent during the same period.

#GameChangers Galore

The Leadership Group gave its first-ever Activator Award to Tri-Valley Ventures as the region’s first venture capital fund. Axis Community Health won the 2018 Social Innovation Honor Award in recognition of its work through the region’s 3 percent. Axis offers medical, mental health and addiction counseling services to low-income populations.

Two companies from the Tri-Valley cities were nominated for #GameChanger Awards. One of Pleasanton’s two nominees is using Sania-developed technology at the heart of its business model. MaxTrac makes products with liquid, DNA-based barcodes that enable all types of products to be tracked at any point in a supply chain. The company secured $6.5 million in the first phase of venture capital funding.
Pi Day serves up fun for local students, families

Story and Photos by Lindsey Kibler

There was not a more perfect date for Sandia to host a Family Math Night than March 14 at Tomasita Elementary School. Pi Day is an annual celebration of the mathematical constant Pi, represented by the Greek letter π, and is observed March 14 since 3, 1 and 4 are the first three significant digits.

Sandia’s Community Relations team has been sponsoring Family Math Night at local schools since 2010, when computational scientist Steve Plimpton volunteered to run the program. It was developed to complement Sandia’s already-established Family Science Night. The program has two primary goals: to stimulate excitement and interest in math among elementary school children and their parents and families, and: to involve parents and families in the educational process.

The program initially was offered twice a month, Steve said, but is now held each Wednesday night during the school year thanks to Sandia volunteers John Mitchell, Brenna Hautzenroeder, Karen Devine and Melissa Benavidez.

“Sandia promotes family evenings because it gives parents and kids an opportunity to discover together that math and science are everywhere, affect everything in their lives and can be fun and challenging,” said Community Involvement Manager Amy Tapia.

Sandia provides all materials and instruction, which include hands-on math games and puzzles that require children and their families to work together to solve simple, inquiry-based problems. The activities and games come from the Family Math program developed by the Lawrence Hall of Science in Berkeley, California, for elementary school age children.

Sandia will sponsor 35 Family Math Night events during the 2017-2018 school year at no cost to the schools.

Steve said, “As long as we have volunteers willing to participate and schools willing to host, my hope is that this great program will continue to be offered for years to come.”