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FLC national awards Page 5

Automating complex 3D modeling

Sandia-developed software could save hours of manual labor

By ***Manette Newbold Fisher***

A team of researchers led by Sandia has invented a first-of-its-kind software for scientists to create accurate digital representations of complex objects.

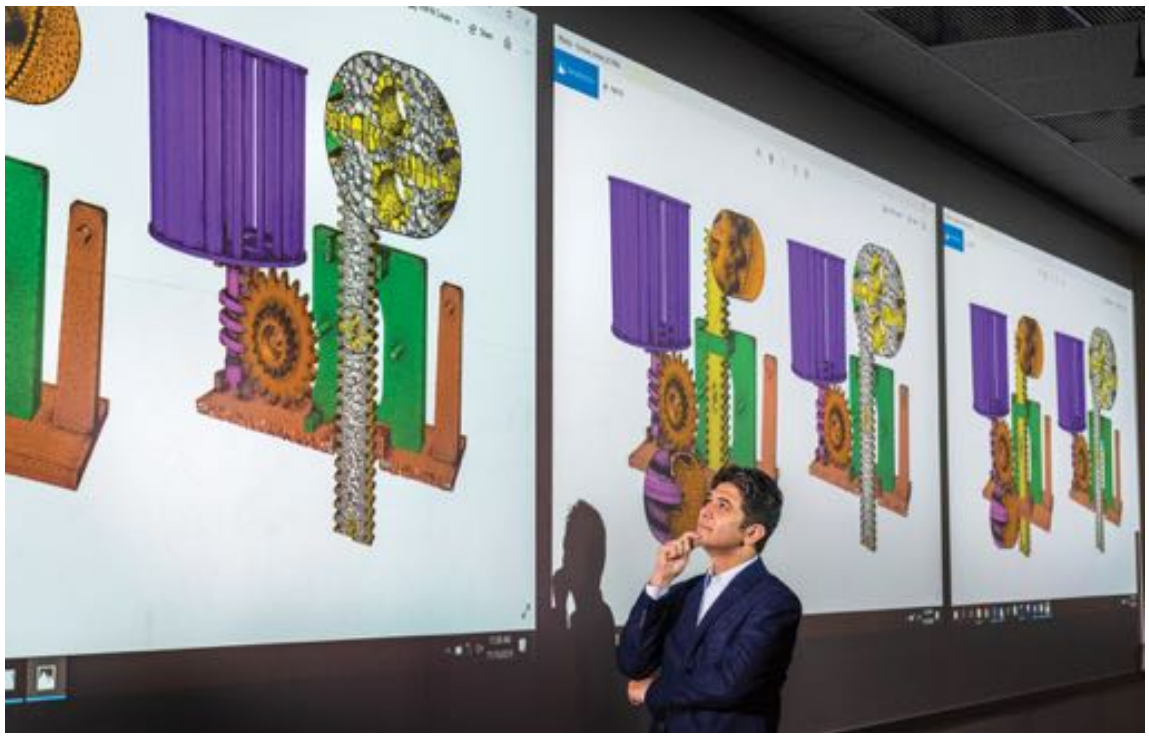
The new software, VoroCrust, offers a novel way to create digital representations, called meshes, used by scientists in many disciplines to create geometric models of all kinds of parts, from rotors to wheels to protective equipment.

Complex meshes often have curves, sharp edges or holes. Once created, they look like 3D images used in computer simulations that incorporate algorithms to determine when parts might fail in extreme conditions. This is a helpful — and often essential — aspect of design that precedes the creation of prototypes and parts for testing.

For example, a scientist in the aerospace industry might make a mesh of an airplane wing and run it through a computer simulation to learn more about what will happen to it in high wind and extreme temperatures. Some scientists also use meshes to model geology to anticipate underground changes, such as subsurface flows of liquids or contaminants.

VoroCrust incorporates a special type of 3D polyhedral cells, called Voronoi cells, to create the meshes, said Sandia computer scientist and project lead Mohamed Ebeida. Most other mesh-generation methods use 3D tetrahedral or hexahedral cells that can have low quality or are difficult to automate, he said.

Existing methods for Voronoi meshing don't always conform to all corners and angles of complex objects. This can be fixed with manual labor, but it is a tedious process that can take a significant number of work hours, Mohamed said. VoroCrust is the first software to generate Voronoi-cell meshes that conform to complex models without needing to be fixed manually.



NOVEL PROCESS — Sandia computer scientist Mohamed Ebeida worked with a team to develop VoroCrust, a software program that creates meshes using polyhedral cells rather than tetrahedral and hexahedral cells. **Photo by Randy Montoya**

Mohamed has been working on the software for more than three years and said it could reduce many hours of manual labor that scientists currently spend on 3D modeling.

"Sandia identified meshing as the single biggest bottleneck in these analyses. Current practices require human intervention, and VoroCrust provides us with a path toward automating this process to relieve tech staff by reducing the time spent on fixing computer-generated errors in modeling," he said.

A recent manuscript describing VoroCrust has been reviewed and accepted in Transaction on Graphics.

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Stimulating marketplace recovery

Fast-track program offers free Sandia-patented technology licenses for commercial use during pandemic

TECH GIVEAWAY — Sandia developed a pocket-sized anthrax detector later licensed to a New Mexico company. Now, more than 1,000 Sandia technologies and software products can be licensed for free. **Photo by Randy Montoya**

By ***Troy Rummler***

Sandia has announced a new, fast-track licensing program to rapidly deploy technology to a marketplace reeling from the effects of COVID-19. The move is designed to support businesses facing widespread, often technical challenges resulting from the pandemic.

"In light of the national emergency, we're making technology transfer as simple as possible," said Mary Monson, senior manager of technology partnerships and business development. "The Rapid Technology Deployment Program is an effort to streamline deployment of potential solutions to our partners in industry."

Under the new program, more than 1,000 Sandia-patented technologies are temporarily eligible for any U.S. person to use commercially for free. People can visit Sandia's Rapid Technology Deployment Program website to apply for free licenses valid through Dec. 31, 2020. The fast-track licenses are nonexclusive, meaning more than one person can hold a license to use the same technology.

The website contains information on which patents are available to license, as well as information about patents formerly held by Sandia that now are in the public domain and do not require a license to use.

Sandia's new Rapid Technology Deployment Program will:

- Eliminate financial or contractual barriers to mobilizing technologies.
- Expedite transfer of intellectual property by eliminating fee negotiations, transferring intellectual property in days instead of months.
- Enable licensees to invest their full resources into combating the pandemic and its economic effects.

"This isn't just a public health crisis; it's also an economic crisis," said Susan Seestrom, associate labs director for advanced science and technology and chief research officer. "Companies need new ways of doing business. They need cybersecurity tools so they can operate remotely. They need advanced manufacturing techniques to produce goods that are in high demand. If Sandia intellectual property can help, we want to lower barriers to people getting it."

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LABNEWS Notes

Thunderbird Kudos

New program encourages employees to recognize colleagues' efforts

By ***Stephanie Holinka***

Earlier this year, Sandia launched Thunderbird Kudos, a program that encourages employees to show their appreciation for the efforts of their co-workers and teams.

Uncertainty teaches us to value our time, resources and relationships. Employees can reinforce their relationships with colleagues by visiting kudos.sandia.gov to complete a Thunderbird Kudos submission, which takes about three minutes. The program was designed to be a simple and quick way to tell co-workers that their accomplishments are important.

"The program allows people to build recognition for peers for everyday kindnesses into their practice, in a way that is quick, easy and seamless," said health educator Jenn Perea.

The structure and goals also align to the Sandia Behaviors, a key component of the Labs' performance management system. The giver is not only saying "thank you," but is highlighting how the efforts of co-workers represent the best of what it means to work at Sandia.

Recipients are displayed on the Kudos Wall of Honor, which is visible to the workforce. A recipient can elect to hide their recognition from the wall, however. Information about recipients can be sorted and queried on the website.

"It's the corporate tool for sharing recognition and thanks. I've been here for 25 years, and I've seen many people I know at the Labs move on. My hope is that by increasing recognition, we can keep more of those wonderful people at the Labs," Jenn said.

Even in this stressful climate, Sandia employees have a lot to be grateful for, and it shows in the more than 1,200 Kudos handed out since the program's January launch. Nearly 300 have been awarded since the COVID-19 pandemic began changing the Labs' work environment.

Those Kudos not only brighten the lives of the recipients; they also help the nominators.

"During times of change and uncertainty, gratitude can boost one's resilience and ability to deal with stress," Jenn said.

The Kudos program came about through ideas and support from the "Future Leaders Pathway" during the 2017 management and operating contract transition. The idea was passed to the division Workplace Enhancement Committees, and Jenn and a small team linked all the groups together to develop the structure and guidance.

Designer Andres Padilla and his team built and launched the tool in January. Stephanie Blackwell and Johann Snyder created the communications and advertising to let people know how it worked and how to participate.

"Doing this in a year is a huge accomplishment," Jenn said.

Going forward, she said the team is working with other partners to find a sustainable and consistent way to reward recipients.

"At a time when people are struggling to do their best under novel conditions, a little appreciation can go a long way," she said.

KUDOS FOR COLLEAGUES — Employees can visit kudos.sandia.gov to share their appreciation for co-workers and teams. Recipients are posted on the Kudos Wall of Honor. **Image courtesy of Sandia National Laboratories**

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LABNEWS Notes

EDITOR'S NOTE: Lab News welcomes guest columnists who wish to tell their own "Sandia story" or offer their observations on life at the Labs or on science and technology in the news. If you have a column (500-800 words) or an idea to submit, contact Lab News editor Tim Deshler at tadeshl@sandia.gov.

Mark Sellers recognized for diversity leadership

DIVERSITY LEADER — Associate Labs Director for Mission Assurance Mark Sellers has been recognized for his diversity leadership efforts by Profiles in Diversity Journal.
Photo by Lonnie Anderson

By ***Luke Frank***

Mark Sellers, associate labs director for mission assurance, has earned a 2020 Diversity Leader Award from Profiles in Diversity Journal for advancing the evolution of diversity and inclusion at Sandia.

Mark was recognized for designing and implementing hiring practices that are "impressive and inspiring," said James Rector, the journal's publisher and CEO.

For this year's award, the journal saluted 17 leaders from a variety of industries and organizational levels worldwide for their diversity efforts.

"Leaders have to be directly involved in advocating for a culture of inclusion and diversity to make an impact," said Sandia Chief Diversity Officer Esther Hernandez. "Mark is yet another example of Sandia leadership at every level who walk the talk. His commitment to increasing diversity at the Labs in both his course of action and everyday behavior sparks innovation and achieves the mission success that Sandia is known for."

Mark's award follows Sandia's Innovations in Diversity Award presented by the journal last fall. Companies that are diversity leaders use the expertise of their diversity team in new ways as strategies for change to help meet the challenges of today's business environment, according to the journal. Individual recipients of the Diversity Leader Award view challenges and opportunities through the lens of diversity and inclusion to achieve business success.

"Since coming to Sandia, I've participated in numerous, intensive Sandia seminars and summits that really have opened my eyes to the privileges enjoyed by white males. These experiences have helped me to better appreciate other perspectives and experiences," Mark said. "I've since become more committed than ever to making Sandia a place where diverse interview panels are universal and hopefully lead to greater demographic diversity."

Mark leads quality assurance and contractor-assurance systems, cybersecurity defenses and mission computing, and surety engineering and weapons quality at Sandia. He sponsors and directly engages in inclusion and diversity events and activities, participates in the corporate reverse-mentoring initiative and implements diverse interview panels for all manager positions.

"Fully expressing and exploring differences of opinion are essential to our success, and that means constantly striving to be more diverse and inclusive," Mark said. "To the extent that I can influence a premier organization like Sandia in that direction, I'm grateful for the opportunity."

Now in its 22nd year of publication, Profiles in Diversity Journal focuses on diversity and inclusion in business, government, nonprofit, higher education and military settings. The journal highlights mission-driven leadership, best practices, workforce strategies, innovative ideas and important individual contributions in diversity and inclusion.

VoroCrust

CONTINUED FROM PAGE 1

It will be presented at SIGGRAPH 2020, a top computer graphics conference, Mohamed said, adding that "this is quite an honor."

The software was developed in collaboration with the University of Maryland, College Park; the University of Texas, Austin; and the University of California, Davis.

How VoroCrust works

In 3D modeling, analysts create meshes that look like geometric shells around the objects they need to analyze. Ideally, the mesh will look exactly like the object and conform to all edges, but that's not always easy using current meshing techniques.

Common meshing methods typically use the tetrahedral and hexahedral cells to fill the space of an object, moving from the object's interior toward its outside boundaries. However, problems occur when the cells do not conform to the shape near the boundary. Manually fixing this problem is not always reliable and sometimes changes the mathematical properties of the final model, Mohamed said.

One way to imagine the meshing process is to think of filling a mattress. Tetrahedral "cushions" could fill the space easily, but they might be too firm. Hexahedral cushions could be more flexible but might not follow the edges along the top or corners, due to their fixed structure. Using flexible material like a polyhedron that can have an arbitrary number of sides could make it easier to fill all areas and corners of the mattress.

To fully automate the meshing process, Mohamed's team not only used polyhedrons, they also reversed the standard approach and found a way to start at the boundary, rather than the middle, of a 3D model. The team carefully placed points, called seeds, around the boundaries of geometric objects, which then became footholds for Voronoi cells. Once the outside of the boundary is complete, the interior of the object can be filled in with additional Voronoi cells.

Ahmed Abdelkader, a doctoral student at the University of Maryland, worked on VoroCrust with Mohamed and described the advantages of using Voronoi cells.

"The facets are cleaner, like gemstones or diamonds," he said. "They can perfectly and naturally fit together."

Curves present challenges, Abdelkader said, using the examples of bowls and more complex objects like engines. He said it took a lot of work to pin down the necessary ingredient that would set the pieces together perfectly in a mathematical proof. Now, he said, the team is excited to build upon this deeper understanding to enhance the software with more features.

SUBSURFACE MODELS — This image shows a VoroCrust mesh for a geological model with seven layers. Scientists at Sandia and Los Alamos national laboratories have used the software to make geological models as part of their research related to the geological disposal of spent nuclear fuel and high-level nuclear waste.
Image courtesy of Sandia and Los Alamos national laboratories

"The Voronoi magic will happen," Mohamed said. "Once you decompose the object into these well-shaped pieces — these cells — you can mesh any model you want with confidence about the quality of the resulting mesh without any post-processing."

Wide use for government, industry

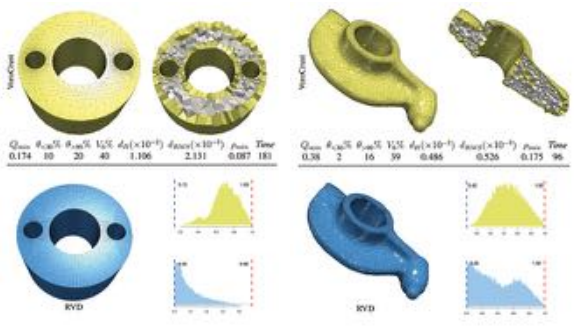
When working on VoroCrust, the goal was to create a software robust enough that it could model any object needed for simulation, said Ahmed Mahmoud, a University of California doctoral student who worked on the software.

Sandia manager Emily Stein and research engineer Tara LaForce have used VoroCrust to make geological models for deep disposal of nuclear waste. Sandia is the lead on a spent fuel and waste science and technology campaign, which, along with Sandia's Laboratory Directed Research and Development program, contributes funding for the VoroCrust project.

Tara said VoroCrust offers promising capabilities for creating a mesh that can run in a reasonable timeframe. Emily added that other meshing methods sometimes distort the mesh, creating a simulation that is not as accurate as it could be.

"The idea is that we could take the geological model as it is and run it without additional manipulation," Tara said.

Carl Gable, who leads the computational earth sciences group at Los Alamos National Laboratory, has used VoroCrust to create geological models as part of DOE's Used Fuel Disposition Campaign, which conducts research related to the geological disposal of spent nuclear fuel and high-level nuclear waste. Two priorities of the campaign are to create design concepts and numerical modeling approaches for disposal systems.



SAVING TIME — These images show 3D models created using VoroCrust, the first software program to generate Voronoi-cell meshes that don't need to be fixed manually.
Images courtesy of Sandia National Laboratories

VoroCrust might create a mesh of an underground repository and the waste in it, or it could create a mesh of the underground geology. This mesh can be used to solve the subsurface flow of liquid and gas in porous material and the transport of contaminants within flowing fluids.

"If you're making an airplane, submarine or car, one of the first steps is building the computational framework you're trying to represent," Gable said. "In our case, it's geology. We need to represent tunnels, canisters and waste packages, and we also need to represent the natural system — the geological system — and VoroCrust is a tool that shows great promise for doing that."

Achieving technical readiness

Mohamed said while the research problem of creating geometric meshes with Voronoi cells has been solved, the technical readiness of the software is not at a place where it could be used off-the-shelf.

Sandia manager Joe Bishop, who has been interested in VoroCrust for years, said modeling and simulation engineers on his team could benefit from the software for simulations if current software packages can leverage the polyhedral elements.

"We need to know if we can run our simulations on these objects and compare it to tetrahedral and hexahedral methods," he said. "VoroCrust is a promising tool. It could provide the geometry, and we would do the physics."

Research licenses

VoroCrust is currently being tested by a few other government agencies and universities. The software has been awarded one patent, and two additional patent applications have been filed. Research licenses are available through Sandia's Intellectual Property office. Visit ip.sandia.gov to learn more.

Long may you run

Retired Sandia engineer turns 100, continues active lifestyle

By ***Manette Newbold Fisher***

He's 100, still going strong and encouraging others around him to do the same.

Friends and family of former Sandia mechanical engineer Larry Johnson say they have no doubt he'll keep showing up like he has done in many areas throughout his life.

Johnson retired after 38 years at the Labs, and when asked how it was, he said, "I worked until I was 75 years old, so that will tell you something. The boss kept asking me, 'Why don't you stay another year,' and I would say, 'Oh, OK, I'll stay.'"

Johnson worked for many years in aircraft compatibility, making sure military aircraft could withstand certain environments while carrying nuclear weapons. He worked on drop testing and electrical system controls and completed flights in high temperatures and supersonic conditions, he said.

Johnson traveled to Europe many times for work, and back and forth to Tonopah, Nevada. He participated in development projects that involved analyzing drawings and schematics to see if aircraft would be compatible with weapons.

"We had a lot of good projects, and we did really well," Johnson said. "I was excited about the job I had."

From farm to WWII to Sandia

When asked about significant developments and events over the past 100 years, Johnson chuckled and said, "That's a big story."

He grew up on a farm in Ohio where they grew food and raised chickens, cows and horses.

"My dad said the only things that he bought were salt, sugar and coffee," Johnson said. "We raised everything else at home on the farm."

Johnson's family didn't have electricity until he was in high school, and he remembers riding to his grandma's house in a horse and buggy until his dad got their first vehicle — a Model T Ford truck that his parents and all six kids would pile into.

"My goodness, the things, the progress we've made," Johnson said. "Telephones, gadgets, cellphones, cars and food."

World War II took Johnson to Amarillo, Texas, where he was stationed as a mechanics instructor and flight engineer. After the war, he attended Texas Tech University, and then got a job at Sandia and moved to Albuquerque.

Former co-workers said Johnson was a mentor and someone who was always willing to help.

"It was a real pleasure working with Larry," said Andy Rogulich, who worked in the aircraft compatibility group and now works as a technical advisor in nuclear surety and certification for the U.S. Air Force Nuclear Weapons Center. "He was just a super individual. He was very knowledgeable, he was fun to go on business trips with, he was very well respected by all of his peers, and it was a real asset to Sandia to have someone of his caliber and knowledge."

100 AND COUNTING — Friends and family of Larry Johnson celebrated his 100th birthday on April 5 with waves, cheers and well wishes from their cars. Another celebration is planned for later this year. **Photos by Randy Montoya**

Donald Gluvna, who worked as a mechanical designer in aircraft compatibility, said Johnson helped him get into a field he knew little about initially, and he's remained a good friend for decades.

"He was an extremely good mentor," Gluvna said. "He would always spend time with me whenever I had any questions."

Riding and running through life

Outside Sandia, Johnson was and continues to be an accomplished athlete and volunteer. He served on the Sandia Peak Ski Patrol for 30 years, and his friend Alton Donnell said he's always been the type of person who showed up ready to work.

"He was always willing to do just about anything," Donnell said. "He worked hard, he showed up early, he never needed to be told to do anything. He was just one of those guys. He was just a real giver, never looking for any glory."

Johnson competed in about 25 marathons, including Boston, and in National Senior Games all over the country until age 99, when he competed in the 50-meter dash. He was honored with the Personal Best National Senior Games Award at age 94, which recognizes service and staying fit consistently for a lifetime.

He's done many bike races and duathlons, and for several years, starting when he was 90, he biked 100 miles indoors at a gym for his birthday.

"People would sign up and we had shirts made for everybody who participated. That was just kind of the connection and the influence that Larry had on the whole gym," said Johnson's spin instructor Terri Pachelli, who has known him for decades and competed with him in duathlons.

"Larry probably did that 100-mile ride up until he was about 95 or 96. In the past couple of years, we've cut back and called it Larry's Ride. It's an hour ride, which is about 25 miles. We just put a time on it and celebrate."

Due to COVID-19 social distancing guidance, Johnson's friends and family celebrated his 100th birthday April 5 with a drive-by parade as he sat in his driveway on a "throne" decorated by his granddaughter.

The party he had planned was supposed to take place at Los Poblanos with family and friends from Sandia, the ski patrol, his spin classes and more, but that will have to wait until later this summer when there are fewer worries about COVID-19 exposure. Whenever it happens, it sounds like there will be a big crowd.

In addition to his friends, Johnson said he enjoys spending time with his four children, who all live in Albuquerque. He and his wife, Billie Ann Johnson, were married for 68 years before she passed away. They have a handful of grandchildren and another handful of great-grandchildren.

Johnson continued to attend Pachelli's hour-long spin classes up to three times a week until gyms across the state closed due to COVID-19. He'll be back at it as soon as he can.

"He's always ready to work out. I have to motivate some people, but I never have to motivate Larry," Pachelli said. "He brings that inspiration with him to class, and I use him when I feel like people aren't really working out hard enough. I always say, 'Larry is working a whole lot harder than you are.'"

At 100, Johnson's advice for others is simple.

"Keep moving," he said. "Enjoy life, save a little money and get out and do stuff."

AIRCRAFT COMPATIBILITY — Larry Johnson, far right, stands with a group of Sandia employees holding a B-61 test unit in 1976. Johnson worked at the Labs for 38 years, retiring at age 75.
Photo courtesy of Sandia National Laboratories

KEEP MOVING — Former Sandian Larry Johnson's advice for longevity is to stay active and enjoy life.
Photo by Randy Montoya

PERSONAL BEST — At age 94, Larry Johnson earned the National Senior Games Personal Best Award, which honors services and a commitment to stay fit over a lifetime. He competed in the National Senior Games nearly every year, starting in 1987 and continuing until he turned 99.
Photo by Janelle Johnson

WHEELS KEEP ON TURNING — Larry Johnson has competed in many cycling races and continues to enjoy working out with a local spin community.
Photo by Janelle Johnson

Federal Laboratory Consortium honors Sandia successes

Innovations developed at Sandia bring home four national awards

By ***Manette Newbold Fisher***

Technology that helps men test their fertility is among Sandia's four national award winners honored by the Federal Laboratory Consortium for work to develop and commercialize innovative technologies.

"These awards are highly competitive," said Jackie Kerby Moore, Sandia's manager of technology and economic development and the Labs' FLC representative. "This year our honorees include three start-up companies who are successfully deploying Sandia technologies, creating jobs and generating far-reaching impacts."

The FLC is a network of more than 300 federal laboratories, agencies and research centers. The national FLC awards are some of the most prestigious honors for federal laboratories and industry partners that demonstrate outstanding technology transfer achievements.

The tech transfer success that led to the Trak Male Fertility Testing System received an Impact Award, a new category this year that honors efforts and successes that have made a lasting impact for people or the marketplace, ranging from a local to global scale.

Former Sandia inventors Greg Sommer and Ulrich Schaff developed Trak, which is based on the Labs' SpinDx portable lab-on-a-disk diagnostic technology, originally developed to detect biological and chemical threats.

When Sommer realized there could be multiple commercial applications for the SpinDx technology, he left Sandia through the Entrepreneurial Separation to Transfer Technology program and started Sandstone, a company that specializes in producing medical products and research tools to improve healthcare. Schaff later left Sandia to join the company.

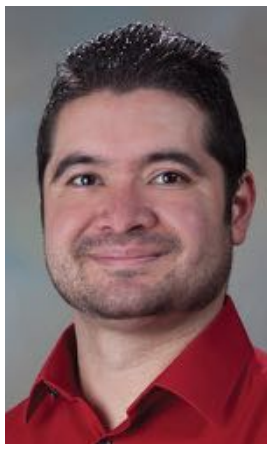
Trak enables men to measure, track and try to improve their sperm count at home to boost their chances for conception.

"Trak is a private, discreet and complete home testing system that is as accurate as the lab," said Sommer. "It is not only a testing device, but an entire system to help men make changes to their health and lifestyle to improve their reproductive health."

Sandstone continues to refine and develop the technology, which they now call CentriFluidics. The company has applied its technology to additional diagnostic areas, including infectious disease.

The other Sandia innovations that earned national FLC awards this year include:

- Efforts made by business development specialist Jason Martinez to increase partnerships and research between the Labs and nonfederal entities.
- Research that enabled a Sandia scientist to start a company using hydrogen fuel cells to power vessels.
- Creativity in technology transfer that helped a company obtain funding to build a reactor to produce medical isotopes for the world.



CRADA STRATEGY — Sandia business development specialist Jason Martinez earned a national Outstanding Technology Transfer Professional Award for his work to develop a strategy for Cooperative Research and Development Agreements.
Photo by Lonnie Anderson

Connecting with universities, businesses

Jason received an Outstanding Technology Transfer Professional Award for his work to promote and set records for Sandia's Cooperative Research and Development Agreements, the only binding mechanism that allows DOE labs to collaborate with nonfederal entities, including universities and businesses.

Jason developed and implemented the first CRADA strategy for Sandia. Since its inception in 2015, the strategy has helped the Labs' CRADA portfolio grow each year, and the contract value has surpassed that of previous years. The strategy generated growth through education and outreach; builds, manages and leverages relationships across organizational boundaries; and promotes CRADAs as mechanisms to harness the innovation of industry and affect laboratory capabilities.

"Providing exceptional service in the national interest from a technology transfer perspective requires a proactive, hands-on approach," Jason said. "Expanding collaborative opportunities with a risk-conscious strategy supports the mission of Sandia and the Department of Energy by addressing germane and exigent national security concerns while benefiting the academic and business community through the transfer of knowledge and capabilities."

Other results of the strategy have been a reduction in CRADA processing time from six to two weeks and vastly improved customer satisfaction, as measured through surveys.

Hydrogen fuel cell vessels

Sandia received an Excellence in Technology Transfer Award for evaluating and demonstrating the feasibility of using hydrogen fuel cells in maritime applications.

Fuel cells turn hydrogen fuel into electricity using no moving parts while producing no exhaust other than clean water. But until an inquiry from a San Francisco ferry boat operator in 2014, scientists in the U.S., including those at Sandia, had not yet studied how to apply hydrogen fuel cells to ships.

Sandia physical chemist Lennie Klebanoff and former Labs scientist Joe Pratt had previously researched how hydrogen fuel cells could be used for vehicles, construction lights, power generators and power on board commercial airplanes. When the inquiry came in to apply the technology to ships, the researchers applied their knowledge on hydrogen fuel cells to determine the feasibility of using them on vessels.

After Lennie and Pratt developed a method to use hydrogen fuel cell technology for maritime applications, Pratt left Sandia through the Entrepreneurial Separation to Transfer Technology program, launching Golden Gate Zero Emission Marine.

Pratt's zero-emission marine company is a full-service provider of hydrogen fuel cell marine power systems that are clean and quiet and comply with all current and projected environmental regulations.

EMISSION-FREE VESSEL — Golden Gate Zero Emission Marine's Water-Go-Round vessel pictured here will use hydrogen fuel cell technology validated at Sandia. The successful collaboration earned a national Excellence in Technology Transfer Award.
Photo courtesy of Golden Gate Zero Emission Marine

With a technically solid foundation based on the Sandia studies, the company received funding to construct and deploy the first hydrogen fuel cell vessel in the western hemisphere and the first commercial fuel cell ferry in the world. The vessel, named the Water-Go-Round, is scheduled for christening later this year.

Sandia now has a CRADA with the company to independently measure the performance of the fuel cells on the Water-Go-Round.

Radioisotopes for medical use

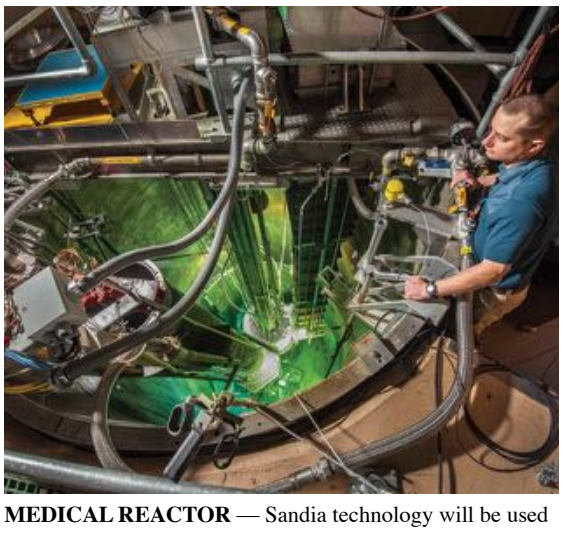
The FLC honored Sandia with an Excellence in Technology Transfer Award for developing a way to make medical isotopes with a small, low-power reactor using low enriched uranium and transferring the license to Eden Radioisotopes. Following some changes to the license, the company received funding in 2019 to build a reactor in southern New Mexico to make the isotopes. This will help with the worldwide shortage of isotopes that are critical to the medical field.

Medical isotopes are used around the globe in imaging procedures that diagnose heart disease, cancer and other life-threatening conditions. Building the reactor created a new and robust capacity to replace a limited number of aging reactors in the world that produce molybdenum-99, or moly-99. Moly-99 decays to technetium-99m, a short-lived isotope that can be used to make individual patient doses, said Eden Chief Operations Officer Chris Wagner. When any of these aging reactors experience unplanned outages, it can quickly cause patient dose shortages and price spikes.

Medical isotopes are used for 40 million nuclear medicine diagnostic procedures worldwide each year, Wagner said. In the U.S. alone, these isotopes are used for more than 40,000 medical diagnostic and therapeutic procedures each day.

"The new Eden reactor has the ability to assure a reliable future supply of medical isotopes for millions of patients worldwide," Wagner said. "Making a difference in the lives of heart and cancer patients by helping to obtain diagnostic information is what motivates the team at Eden."

TRACKING SUCCESS — The Trak Male Fertility Testing System is an at-home kit that uses Sandia technology originally developed to help detect biological and chemical threats. The successful transfer of the technology to Sandstone Diagnostics was recognized with a national Impact Award from the Federal Laboratory Consortium.
Photo courtesy of Sandstone Diagnostics



MEDICAL REACTOR — Sandia technology will be used by Eden Radioisotopes, a company planning to build a reactor primarily to produce medical isotopes to meet a global need. The tech transfer success earned a national Excellence in Technology Transfer Award. **Photo by Randy Montoya**

Finding a big life on the open road

After 15 years in a part-time job, Brian Olson has some stories

*Story by **Michael Ellis Langley***
*Photos courtesy of **Brian Olson***

Brian Olson doesn't have weekends like everyone else. He spends his days away from Sandia driving people all over the state. From ferrying the elite athletes of the National Football League to and from games to saving the lives of 86 people during a mass shooting, it's been an interesting trip.

"I'm a logistics technical professional," Brian said of his work at Sandia. "We manage shipping and receiving, mailroom, fleet, reapplication and disintegration, shredding stuff, moving stuff around site. I supervise the technical parts of Logistics — working on our large contracts, maintaining and enhancing our mobility projects and constantly working on ways to improve our services. And all of this using integrated service delivery as the umbrella, which is a big part of our organization."

Brian started at Sandia's Livermore campus in 2000 as a contractor, becoming a full-time employee in 2012. His favorite part of the job is the unknown.

"My normal day? Putting out fires," he said with a laugh. "What's going to come across the email when you open it up in the morning? That sometimes could occupy five minutes of your time to fix that, or it could take all day. I love figuring out how to tackle the unknown stuff. That's the thing that keeps me coming back — the new stuff every day."

Those impossible-to-predict requests have ranged from moving a case of water to responding to a box containing a live animal.

"It seems like if it doesn't fit anywhere, it ends up in Logistics. We will figure it out," he said, smiling at how most people see his department.

If that seems like enough stimulation for a week, you haven't met Brian.

Weekend warrior

"In 2005, I don't know if it was out of boredom or stupidity, I went into Storer Coachways (in Modesto, California) and asked, 'Do you ever hire weekend drivers?'" Brian said. "I thought it would be kind of fun to go places and do things on the weekends."

The company hired him but said he probably would work two weekends a month driving tour shuttles, casino trips and shopping runs to San Francisco. Brian laughed as he remembered how it really went.

"For the first two years, I worked every weekend. Never a weekend off."

Brian has spent the past 15 years working four days at Sandia/California, handling the logistics of hundreds of people and dozens of projects, and then two more days behind the wheel of large tour buses, going places he never thought he would see.

"I've been to places I know I would have never gone myself," he said. "There's museums down in L.A. I never knew existed."

Hero in the making

He could not have known how his decision all those years ago would affect the lives of dozens of people in July 2019. It was a hot Sunday and the smell of garlic was everywhere as Brian loaded passengers onto his 54-seat bus to ferry them out of the Gilroy Garlic Festival. He had no idea that a short distance away, 19-year-old Santino Legan was about to open fire, killing three people and shooting 17 others before taking his own life.

"The shooter was about 150 yards away," Brian said. "I heard the shots, and everyone started running out of the festival in pure panic. People ran onto my bus. I loaded 86 passengers onto my 54-passenger bus. There were children and parents covered in dirt from diving on the ground once they heard the shots."

Brian drove his busload of people out to safety. Then he did something few others would have — he drove back in.

"I took them to a safe area and returned to evacuate more of the festival attendees," Brian said. "It was one of the most stressful days in my driving career."

Brian's actions on a day that was unlike any other in his life earned him a Heroism Award from Storer Coachways.

Team player

Since 2010, most of Brian's weekends from September to January are prescheduled. Storer Coachways has a contract with the NFL to drive visiting teams to games at the Bay Area stadiums for the San Francisco 49ers and the former Oakland Raiders.

"The players are really nice," Brian said, dispelling the myth of bad-behaving millionaires. "I have no bad stories with them. Every one of them, from the top athletes to the guys who just came in, they are all 'Thank you,' when you hand them their luggage from under the bus. They usually will pat you on the back."

Even after a hard-fought game, players are professional.

"You don't see any emotion," Brian said. "When they come back to the bus, they have their headsets on, maybe talking to family, but very rarely do you hear them say anything. It is dead silent. All you hear is the tick-tock, tick-tock of the flashers going down the highway as the CHP (California Highway Patrol) escort us back to the airport. If they won or they lost, you don't see any difference. They just want to go home."

ADVENTURE AWAITS — Sandia logistics technician Brian Olson, who drives for Storer Coachways on weekends, stands by his bus, waiting to take a National Football League team to the airport after a game.

To date, Brian has driven the Indianapolis Colts, Seattle Seahawks, Denver Broncos, Kansas City Chiefs, Tampa Bay Buccaneers, New York Giants, Green Bay Packers, Los Angeles Rams, Tennessee Titans, Dallas Cowboys, New York Jets, Cincinnati Bengals, New England Patriots, Pittsburgh Steelers, Chicago Bears, Los Angeles Chargers and Washington Redskins.

"I had the nice opportunity of driving the Broncos for the Super Bowl in 2016," Brian said of the championship game played that year at Levi's Stadium in Santa Clara. "That was pretty much the highlight of my driving career."

Though he gets a hat from each team — to wear when he drives them — Brian said that he doesn't play favorites.

"Who do I root for? Every team that I drive," he said, with a deep laugh.

Prepared for the unknown

Brian sees a connection between the unexpected things that come up in both his part-time driving job and his career at Sandia.

"I didn't really think about it before now, but it is about problem-solving the unknown for both," he said. "It's sitting in that chair with the problems of Sandia and learning how to solve them, and it's the anticipation of that trip every weekend and figuring out where I'm going and how I'm going to get there."

While most people look forward to their weekends at home, relaxing, Brian looks forward to each week and weekend bringing new possibilities.

"On Sunday night when I get home, I'm sometimes like, 'I don't want to do this job anymore. I just want a weekend like everyone else,'" he said. "Then by Wednesday, I'm like, 'I wonder where I'm going this weekend.' Everyone else plans their trips. I don't know until I get the work order Friday night. It's great!"

HERO HONORS — Brian Olson earned an award for his heroic actions, driving people to safety during the mass shooting at the Gilroy Garlic Festival in July 2019.

TEAM SPIRIT — Sporting a Green Bay Packers hat, Brian Olson gets ready to take the NFL team to Levi's Stadium.

ON THE ROAD AGAIN — Since 2005, Brian Olson has held a part-time job as a bus driver for Storer Coachways on his weekends away from Sandia.

Mileposts

New Mexico photos by Michelle Fleming
California photos by Randy Wong


Walt Gutierrez 35


Dominic Montoya 35


Gordon Roubik 35


Larry Friday 30


Hae-Jung Murphy 30


Lee Moo 25


Eric Romero 25


Mark Rule 25


Jeff Smith 25


Sherry Stone 25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Barbara Allison 20


Reuben Baca 20


Robert Bernstein 20


Adrian Chavez 20


Shannon Delgado 20


Rick Dietrich 20

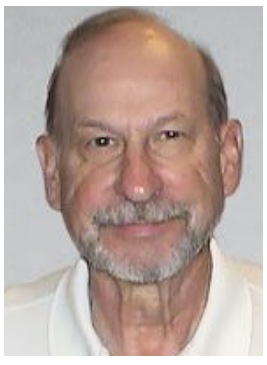

James Duncan 20


Steve Handy 20


Ken Hatfield 20


Devan Myers 20


Kendall Pierson 20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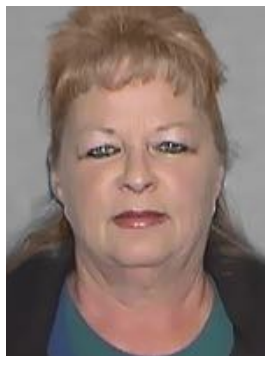
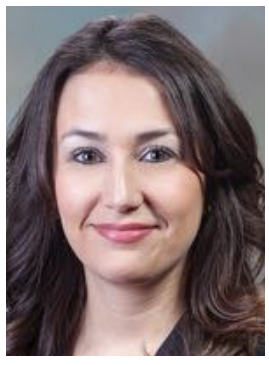
Leo Bynum 15


Belinda Christakis 15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Recent Retirees

New Mexico photos by Michelle Fleming
California photos by Randy Wong


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Paul Graham 31

Stimulating marketplace

CONTINUED FROM PAGE 1

As a multipurpose engineering laboratory for NNSA, Sandia invents technologies for research purposes and maintains patents under nine categories: bioscience; electromagnetics; energy and environment; information and computer systems; manufacturing and assurance; materials, chemistry and nanoscience; microelectronics and microelectromechanical systems; security and defense; and sensors and detectors. Sandia routinely grants licenses to businesses, universities and individual entrepreneurs to use these technologies for other commercial purposes.

The free, temporary licenses come with minimum restrictions. Technologies cannot be exported, so applicants must be legal U.S. residents, and businesses must legally be able to contract with the U.S. government.

Visit ip.sandia.gov for information about free, temporary, non-exclusive licenses for technology and processes patented at Sandia. To obtain a license, interested individuals must:

- Be a U.S. current resident (licenses are not available for export).
- Submit an application.
- State the intended business purpose in the application.

Serving up kindness

Sandia employees, family members and friends volunteered at the Alameda Food Bank in February. The volunteers packaged foods for distribution to families in need in the Bay Area.

By ***Tatiana Del Cid***

More than a dozen Sandia/California employees and their friends and families helped fight food insecurities throughout the Bay Area with the Alameda County Community Food Bank at the second quarter Sandia Serves Saturday event on Feb. 27.

Volunteers jumped into action, donning aprons and hairnets to pack and seal bags of pasta while others got busy sorting and bagging produce.

Nalini Menon said she was grateful for the opportunity to spend quality time with her family while making a difference in the community.

"Volunteering is a small way for my family to give thanks for everything we have," she said. "My family loved every moment, and we are inspired to do more volunteer events in the future."

Sandia volunteers helped the Alameda County Community Food Bank pack 624 pounds of pasta and 14,298 pounds of fresh produce that will help to put about 12,000 meals on the tables of Bay Area families in need.

For more than 30 years, the Alameda County Community Food Bank has delivered on their mission to promote hunger-free communities by distributing millions of healthy meals to local food banks and pantries that serve families and individuals in need. Sandia is proud to support their mission and play a part in building stronger communities through family stability.

"Having Sandia organize the event, and all we had to do was show up, was great. The food bank is an amazing place, it was much larger and more organized than I expected," said Jerry Mcneish. "It is kind of unbelievable in our economic bubble to have so many folks in need."

Nick Medina, left, and Gina Madison bag pears.

Florencia Prada finds joy in making a difference.

Amanda Dewyer, right, and her friend pack bags of pasta.

Jonathan Hu, center, packs pears with his wife and daughter.

Michele Khan, left, and Frank Bieleki bag fresh pears.

Nalini Menon, right, and her family pack and seal bags of pasta to fill donation boxes for families in need.