



S A N D I A

LAB NEWS

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women
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Reusable respirator could finally ease COVID-19 medical mask shortages



BREATHE EASY — Engineer Todd Barrick models a prototype of the comfortable, all-day respirator he and 16 colleagues developed to complement disposable N95 masks.

Photo by Randy Montoya

Sandia retools facilities to design, test all-day mask

By **Troy Rummler**

Many medical professionals and other essential, frontline workers have struggled for the past year with persistent shortages of N95 masks.

Soon, they might get relief from a Sandia invention — a comfortable, reusable respirator that could ease demand during the current or future health crises.

Sandia has filed a provisional patent application and is testing prototypes and seeking potential manufacturing partners.

“We have developed and tested a preliminary design, which meets many of the requirements for a medical-grade, reusable N95 mask,” said Todd Barrick, an engineer on the project. Requirements for N95 certification include proper filtration, fit and airflow.

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**LAURA
MCGILL**

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Common ‘core’: Using molecular fragments to detect deadly opioids

Sandia detection method might someday be incorporated into hand-held instruments

By **Melissae Fellet**
and **Mollie Rappe**

Researchers at Sandia have developed a method to detect trace amounts of synthetic opioids. They plan to combine their approach with miniaturized sensors to create a hand-portable instrument easily used by law enforcement agents for efficient detection in the field.

Fentanyl is a fast-acting, opioid-based pain reliever that is 80 to 100 times more potent than morphine. Illegally produced fentanyl often is mixed with other drugs



JUST A BIT — A photo illustrating 2 milligrams of fentanyl, a lethal dose for most people, compared to a penny. Matthew Moorman, a Sandia researcher, has developed a new method to detect tiny amounts of fentanyl analogs based on their common molecular structures.

Image courtesy DEA

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LAB NEWS Notes

EDITOR'S NOTE: We've stopped printing the *Lab News*, but will continue to publish every two weeks. We want you to remain in our community of readers, so please send your comments and suggestions for stories or for improving the paper. *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 Jim Danneskiold at jddanne@sandia.gov.

Retaining knowledge of nuclear waste management

Sandia experts share experience in storage, transportation, disposal with next generation

By **Mollie Rappe**

Have you ever started a new job and spent a lot of time figuring out everything from how to get paper for the printer to whether an important customer prefers quick phone calls to emails?

Imagine if that important customer was the federal government and the project you were working on was evaluating the development of a geologic repository for the permanent disposal of spent nuclear fuel and high-level radioactive waste.

Experts at Sandia just began their second year of a project to capture important, hard-to-explain knowledge from retirement-age employees related to nuclear waste management to help new employees get up to speed faster.

"At Sandia, we've had over 45 years of experience in nuclear waste management in the U.S. and internationally," said Tito Bonano, nuclear energy fuel cycle senior manager. "But the expertise and experiences of people like myself, Peter Swift,



SHARING THE KNOWLEDGE — In this photo taken prior to the COVID-19 pandemic at Sandia's boiling water reactor test site, Tito Bonano, right, shares his knowledge on energy research with Efrain O'Neill, an electrical engineering professor at the University of Puerto Rico, Mayagüez, who spent a year at Sandia recently.

Photo by Randy Montoya

Ken Sorenson and others who have retired or are retirement age, walks away when we leave the organization. We refer to that kind of expertise and experiences as tacit knowledge, and we had to act to stop the bleeding of tacit knowledge.”

Tacit knowledge includes understanding the boss’s opinions as to why a competitor is doing well to the best way to work with an important customer. Such knowledge is often difficult to explain. Explicit knowledge, which includes things such as a phone number or the temperature of water, is easier to document and communicate to others.

Explicit knowledge can be captured in reports and spreadsheets, but tacit knowledge is often learned through mentorship, observation and practice.

“Most large organizations, laboratories and government agencies are very good at saving their explicit knowledge, in the form of reports and documents,” said Janette Meacham, the nuclear energy fuel cycle program’s licensing and knowledge management lead. “But the knowledge that comes from going into Tito’s office with a difficult problem and having him say, ‘I remember 15 years ago we did something similar and this is how we did it and you need to watch out for this other thing,’ is not captured in a report.”

Through focus group discussions, a multiday workshop, a series of four-hour deep dives and recording interviews with retiring employees, the knowledge management team led by Janette captured this tacit knowledge and is in the process of organizing and tagging it to make it easier for early-career and new employees to access.

Preserving this contextual knowledge will save time and taxpayers’ money, especially when the federal government begins work on a permanent nuclear waste disposal solution, Tito said.

“As a [Federally Funded Research and Development Center](#), we have a responsibility to be good custodians of the knowledge we’ve developed to benefit future projects,” he said.

Focus groups, videos capture hard-to-explain knowledge

Starting in 2019, the team conducted focus groups with employees who had been with the Labs less than five years, five to 10 years and more than 10 years to discover how each group best learns and wants to access information.

“One of the tenets of a successful knowledge-management project is getting the right information to the right people at the right time in the right format,” Tito said. “Future generations are going to need to solve the country’s nuclear waste management problem. We want to make sure that all of the knowledge we capture ultimately supports the licensing of a nuclear waste management facility.”

Then, Sandia hosted a three-day workshop with experts, retirees and federal representatives. Each speaker had some prepared remarks, but the most valuable part of the workshop was when the experts responded to questions from the audience, Janette said. About 50 Sandia employees at all stages of their careers attended the workshop to learn directly from the experts and the workshop was recorded for future reference.

They also hosted a series of four-hour deep dives on complex topics, such as how to effectively get expert opinions for risk assessments and understanding how various regulations on nuclear waste management overlap with each other. Each deep dive was led by an expert who started the discussion with prepared information and then answered a lot of productive questions from an audience of 15 to 20 employees. The sessions also were recorded. There were six deep dives last year and there will be four more later this year.

Also, as other important topics come up in the ordinary course of business, the team records interviews with experts and recently retired employees to capture their tacit knowledge.

The recordings of each session or interview, searchable transcriptions, the experts’ slides and links to the documents they referenced are all available to Sandia nuclear energy fuel cycle staff on a SharePoint site. Eventually, Janette hopes to have everything accessible to the DOE and experts at other national laboratories.

Already the site has seen significant use. In an average month, it gets about 2,000 visits from the 180 employees in Sandia’s nuclear energy fuel cycle program, Janette said.

Expanding a culture of knowledge preservation

In addition to the recorded sessions, Janette is working on developing a culture in the organization where capturing tacit knowledge is just as important, and just as integral a part of the job, as capturing



Janette Meacham

explicit knowledge in the form of reports.

To that end, she is leading construction of a taxonomy to tag the recorded seminars and interviews and such explicit-knowledge resources as reports, as well as a more sophisticated database where employees can easily add tacit knowledge. The goal is to make all the information more accessible.

“The first part was getting those interviews, grabbing that information quickly while we could and stopping the bleeding,” Janette said. “At the same time, we have to come up with an overarching system of capturing that information as it is created. We need to make it part of the normal work processes of the nuclear energy fuel cycle staff, and staff across the labs.”

In the future, Janette and Tito hope to extend what they’ve learned about knowledge management, capturing tacit knowledge and making it accessible to early career employees to other Sandia organizations and other agencies.

They already have been asked to collaborate with colleagues at the [Nuclear Decommissioning Authority](#) in the U.K., the [Nuclear Waste Management Organization](#) of Japan and other international agencies as they undertake similar knowledge management projects.

“Everyone else seemed to be talking about the problem of maintaining important knowledge, but we said, ‘We’ve got to do something about it now,’ so we just did it,” Tito said. “It’s part of Sandia’s attitude that we’re here to solve problems.”

The knowledge management project for nuclear energy fuel cycle was funded by the Department of Energy’s [Office of Nuclear Energy](#).

Forbes magazine again tags Sandia as top large employer

AMERICA'S BEST LARGE EMPLOYERS

Forbes 2021

POWERED BY STATISTA

By **Luke Frank**

Sandia again has been recognized by Forbes magazine as one of the 500 Best Large Employers 2021. The Labs also won the distinction in 2017 and again in 2019, shortly after garnering a separate award as one of the magazine's top workplaces for diversity.

The competition is based upon an anonymous survey conducted by Forbes and the market research firm Statista across all industry sectors.

Approximately 50,000 employees who work for companies that employ at least 1,000 in their U.S. operations were asked whether they would recommend their employer, based on working conditions, salary and development potential. Surveyors also asked them to nominate organizations other than their own. The final list ranked employers that received the most recommendations.

Sandia was the only DOE lab and the only New Mexico-based entity to make the list and this year joins companies like Honeywell International, Inc., NASA, Intel Corp., Apple Inc. and Google LLC.


The Forbes distinction comes on the heels of Fairygodboss rating Sandia Labs as one of the Best Companies for Women 2020 and Best Companies where CEOs



SANDIA SCAPE — When employees come to Sandia National Laboratories, they join a dynamic team focused on serving the nation through excellence and innovation. **Photo by Randy Montoya**

Support Gender Diversity. Those honors were based solely on women's anonymous reviews.

"We're competing for the nation's top talent, not just with other national laboratories, but with leading tech and research and development employers,

and Sandia's a great place to work," said Rob Nelson, director of Human Resources. "We'll continue cultivating valued professional and lifestyle opportunities that support a dynamic workforce focused on excellence and innovation." 

Detecting opioids

CONTINUED FROM PAGE 1

such as cocaine or heroin and minuscule amounts can cause death by overdose.

Drug overdose deaths have accelerated during the COVID-19 pandemic, according to the Centers for Disease Control and Prevention.

The chemical structure of fentanyl can be modified to create molecular analogs. These analogs can have different potencies, and the libraries of molecular “fingerprints” that current detectors require must be updated frequently to keep up with emerging analogs.

Matthew Moorman, a Sandia researcher, wanted to develop a method to detect fentanyl analogs based on their common molecular structures or “cores,” rather than by identifying the individual chemical decorations found on each one.

“A lower false-alarm rate with this detection method could lead to more efficient screening of trace amounts of opioids at the border or in mail-sorting stations,” he said.

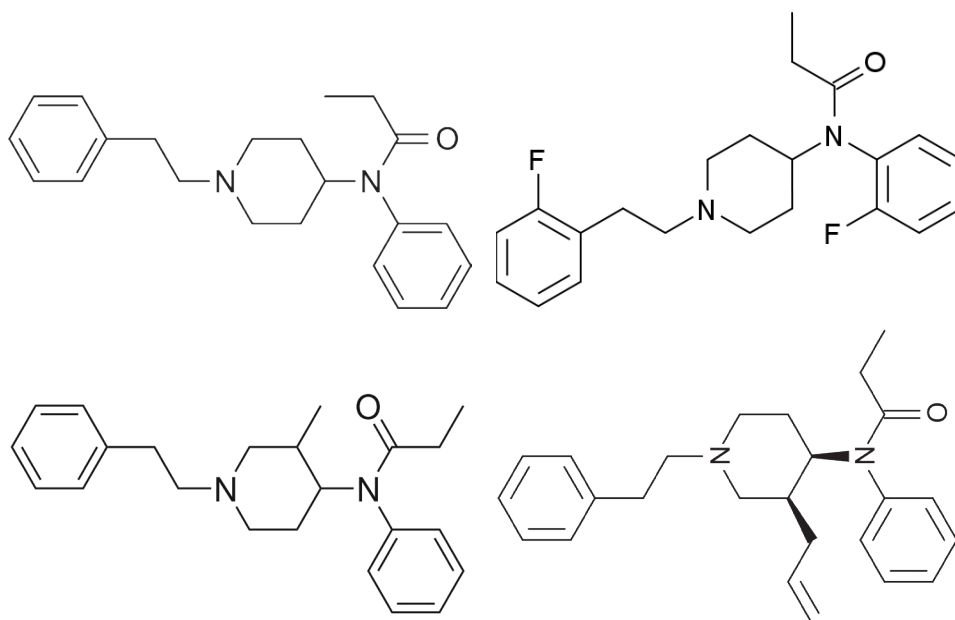
There are thousands of possible analogs of fentanyl, says the **Department of Homeland Security**. Lab-based chemical analysis using sensitive techniques, such as infrared spectroscopy or mass spectrometry, can identify new analogs of fentanyl by their molecular fingerprints.

But the large number of possible fingerprints increases the possibility of false alarms from similar parts of a benign molecule. The result is that law enforcement agents may spend significant extra time doing secondary screening when their sensors did not detect an actual synthetic opioid.

Detecting brand-new analogs

To detect fentanyl analogs based on their common cores, Matthew and his colleagues used a technique that decomposed the molecular structure of several fentanyl analogs. They noticed that the process frequently produced the same molecular fragments.

Using a miniaturized ion-mobility spectrometer developed at Sandia



ALL IN THE FAMILY — The chemical structure of fentanyl (top right) and some fentanyl analogs with different chemical decorations. By decomposing fentanyl analogs, Matthew Moorman’s method allows for the detection the common molecular cores.

Courtesy of Wikimedia Commons

for field-based explosives sensing, they could detect the synthetic opioid-based fragment in a less than a billionth of a gram of sample, even when mixed with agents that drug manufacturers commonly use to dilute the compounds.

Detecting a fragment common to fentanyl’s molecular core means this approach can detect analogs that law enforcement agents don’t know about yet, Matthew said. The small set of signatures also means the researchers could fine tune their chemical detection to create reliable, sensitive sensors.

The work to demonstrate the proof-of-concept fragment detection was funded by Sandia’s **Laboratory Directed Research and Development** program.

The researchers now want to combine this detection method with their miniaturized chemical sensors to develop an instrument that law enforcement agents could use in the field to detect the presence of synthetic opioids. They expect to have a functional, field-tested prototype within 3 years.

They also hope to apply the same fragment-based detection approach to other classes of illegal drugs, such as synthetic cannabinoids, cocaine and ketamines, Matthew said.

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Lifelong curiosity and looking up

Engineers 'advance the human condition,' says Labs' deputy director for Nuclear Deterrence



SOARING TO SANDIA — Deputy Labs Director Laura McGill in front of an F-22 model, a fitting backdrop. Laura began her career at the General Dynamics aerodynamic test facility in San Diego, which later became Lockheed Martin, where she blended her passions for engineering and aviation. She was directly involved in early F-22 wind tunnel testing.

Photo by Randy Montoya

By Jennifer Awe

For a young girl who was fascinated by airplanes and space flight, carried a notebook of science facts and took apart her father's watch just to see how it worked, curiosity has always been a driving force for Laura McGill.

This led her to a fulfilling engineering career with waypoints at the Boeing-funded University of Washington Aeronautical Laboratory, General Dynamics, Hughes, Raytheon, and now, Sandia.

Laura, Sandia's new Deputy Labs Director for Nuclear Deterrence and Chief

Technology Officer, likes to say, "Engineers translate the promise of technology into products and capabilities that make life better and safer. It's the work of engineers that advance the human condition."

Laura was raised in Seattle, near Boeing's headquarters. Her father spent 40 years at Boeing in various roles, working his way up to director of administration — and no, his watch never did get put back together as intended.

'Aviation was a big presence'

"Aviation was a big presence growing up," she said. "Our family regularly attended air shows, and to me everything

'up in the sky' represented the future and unbounded potential. I knew I'd be involved in technology from an early age. My fifth-grade teacher was very influential and encouraged us to be curious and explore." That teacher was a private pilot and a member of the Civil Air Patrol.

"Through his class I was exposed to modules on aircraft flight controls and meteorology, and it changed my life," she said. "I developed an interest in the science and history of aviation."

It was at the University of Washington that Laura realized what engineering really meant, and where an early job in Boeing's aerodynamic test programs offered the

next step to her future. She majored in aeronautical and astronautical engineering and worked her way through school at the Kirsten Wind Tunnel, where she was exposed to the everyday activities of Boeing engineers, as well as their design and test challenges.

"It was a terrific opportunity to indulge my passion for engineering and flight by capitalizing on where I lived," she said.

Laura still enjoys the thrill of solving real-world problems with engineering and sharing that excitement with others. She was elected a lifetime fellow of the American Institute of Aeronautics and Astronautics (2007), was inducted into the [National Academy of Engineering](#) (2019) and is an adjunct professor at Johns Hopkins University's Whiting School of Engineering, where she has taught a number of graduate courses in systems engineering.

Her husband is a private pilot and her father-in-law flew B-52s during the Cold War.

Why Sandia?

After 37 years in the defense industry, why Sandia and why now?

After graduation Laura joined General Dynamics in San Diego. Ten years later she relocated to Tucson, Arizona, with Hughes, and eventually Raytheon, as a result of industry consolidations. There, she served as chief engineer for programs that provided the delivery platforms for nuclear payloads and other advanced weapons systems. She was vice president of engineering for Raytheon Missile Systems for five years, and most recently was deputy vice president of engineering for Raytheon Missiles & Defense.

"I've always admired Sandia and its capabilities," she said. "I knew the people were incredibly talented in technical skills as well as national leadership, so this opportunity was especially compelling. I had a chance to join a critical mission and apply my experience to a key segment of the defense industry. The timing was right, and I embraced it."

Laura has been on the job for just two months and already has uncovered some pleasant surprises.

"There is so much more here than I realized," she said. "More talent, more infrastructure and more capability than I ever imagined — things you have to see from the inside. Every single day I'm learning more about how we are driving the future in numerous dimensions."

Applying innate curiosity is advice Laura has heeded throughout her career, and advice she passes along to others.

"Most of us in this profession are curious by nature," she said. "If you don't understand something, ask questions. If you think it can be improved, challenge it with a helpful mindset: 'How can I make this more effective and successful?' Yet, the ability to prioritize is critical. You can't take on everything at once, so focus on the most relevant opportunities and do the legwork to explore potential solutions."

Near-term priorities for Nuclear Deterrence

With decades of experience as an engineering leader, Laura is focused on areas she believes will best serve Sandia programs and its national security mission. Her near-term priorities for ND will take advantage of the Labs' unique strengths to increase operational effectiveness, she said. She discussed two of those priorities:

- Optimize the deployment of expert technical talent from across the Labs to resolve the most critical issues. "As we provide solutions for some of the nation's most difficult problems, challenges arise that require urgent attention," she said. "Fortunately, we also have world-class expertise in every discipline that can be rapidly leveraged to lead this important work."
- Embed model-based systems engineering into the Labs' program plans. "This includes establishing requirements for defined capabilities and model maturity at key program milestones. These will replace traditional methods where appropriate and accelerate our development activities. It's an area where commercial practices can be implemented with even better results, based on

the strength of Sandia's extensive modeling capabilities. We will focus on embedding and applying, to deliver highly reliable system performance with confidence and predictability."

Model-based systems engineering is the formalized application of modeling to support system requirements, design, analysis, verification and validation activities beginning in the conceptual-design phase and continuing throughout development and later life cycle phases, according to the [International Council on Systems Engineering](#).


"The systems and processes here at Sandia have a long history of producing exceptional results and I want to be part of the team that takes them to the next level," she said. "I will only take on a new assignment if I feel I can make a difference and advance capabilities. I want to add value, work with great teams and, if it's embracing technology, too, well that's just perfect."

Making a new home

After many years in Tucson, Laura is settling into her new city while commuting back to Arizona often to be with her husband and son, who's finishing his senior year of high school.

"Coming from Seattle, the desert fascinates me," she said. "And in Albuquerque more than Tucson, you have real mountains. My family enjoys skiing, so the desert with mountains is the best of both worlds. I look forward to getting out and exploring."

Laura has managed to remain curious throughout her life and career, and it's taken her to the helm of national security and nuclear deterrence at the nation's premier engineering laboratory. The Seattleite and long-time Tucsonan is now a Sandian.

"I enjoy working with brilliant people," Laura said. "Combining this with Sandia's deep commitment to the mission we serve is incredibly powerful. I am thrilled to have this opportunity that builds upon my previous experience. I hit the jackpot with Sandia." 

Inspirational women

Sandia workers celebrate women who have influenced their lives

By **Meagan Brace**

Throughout history, women have played a vital role in shaping society and culture, from advancing science and technology to making notable contributions in medicine, art and education. Some have left their mark on the world in a big way by breaking barriers

and inspiring those who live in the wake of their legacies. Others, although less well-known, have touched the lives of their students, colleagues, family and neighbors through their daily interactions.

In celebration of Women's History Month, members of Sandia's workforce honor a few of the women who have helped shape their own lives and careers.

A sister's shining legacy

"I am the youngest of four siblings and my sister, Laurel Salton-Clark, was the oldest. All my siblings and step-siblings have been influential in my life, but as we entered adulthood, Laurel's path and my own connected not just personally, but professionally as well when I was working at NASA and she became a NASA astronaut. She was a medical doctor who became a Navy undersea-medicine and flight-surgeon-certified officer following medical school and was likely the first woman to deploy on a nuclear submarine in the 1990s. She was selected by NASA to be an astronaut in 1996 and her first flight was aboard the shuttle Columbia for the ill-fated STS-107 mission. Although she and her crewmates perished while returning to Earth, she was and will forever continue to be an inspiration for me and many others young and old for whom her light shined so brightly."

— *Jon Salton, PE, R&D manager*



FLOATING FAMILY — Jon Salton, right, and his sister, Laurel Salton-Clark, float during a zero-G pass aboard the NASA KC-135 zero-G training aircraft. Jon was working on an engineering test and Laurel was flying that day as a test subject.

Photo courtesy of NASA



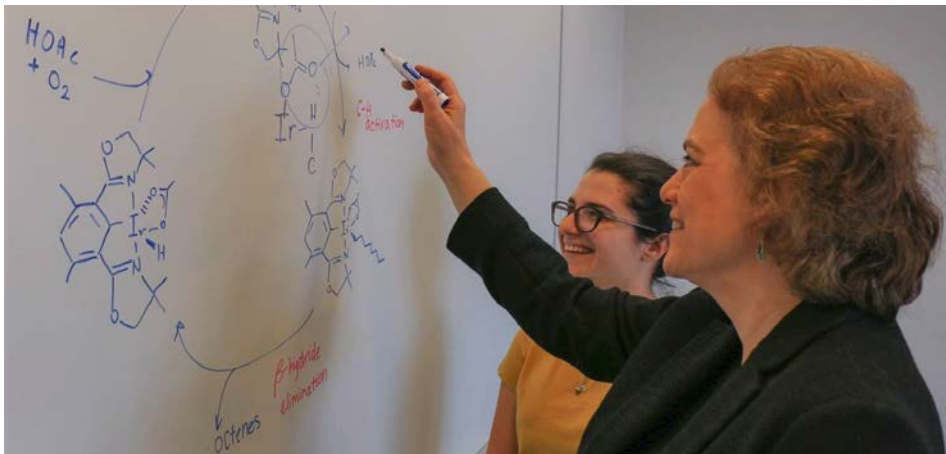
FIRST WOMAN IN SPACE — Aboard the space shuttle Challenger in 1983, Sally Ride became the first American woman to fly in space. One of her keynote speeches led system engineer Chad Davis down a path to success.

Photo courtesy of NASA

A captivating speaker

"When I was a high school senior, I was one of only 100 students across the country selected to attend a leadership conference where Sally Ride was a keynote speaker. Her fantastic speech included advice that stayed with me and helped guide my academic and professional career. She advised that attending the top-ranked undergraduate institution in the country isn't as important as working hard, getting good grades and gaining experience to help you get into a top graduate institution. I followed her advice, choosing for my undergraduate education a slightly lower-ranked school that was offering better scholarships, used opportunities while there to do scientific research and build relationships with faculty, and then leveraged that experience to get into the top graduate program in the nation — ultimately leading to my position with Sandia. Sally Ride's timely advice gave me confidence to make a good decision, leading to a great outcome."

— *Chad Davis, system engineer*



PROBLEM SOLVER — As Tyler Stevens' Ph.D. adviser, Karen Goldberg, right, inspired him to push back the frontiers of science and approach challenging problems by paying attention to small details in the data.

Photo courtesy of Karen Goldberg

An exceptional scientist

"Karen Goldberg was my Ph.D. adviser. She inspires all of her students to, as she often says, push back the frontiers of science. She is highly ethical and strives to fully understand all details related to a project. One of the most memorable things she said to me is 'the data is trying to tell us something, we just need to be better listeners.' This really made an impact on how I approach challenging problems and showed me how important seemingly small details can be. Karen made a big impact on my life — she showed me what an exceptional scientist is."

— Tyler Stevens, electrical engineer

A mentor and role model

"I joined Sandia in 2004. I worked in industry for about 15 years as a software developer contractor to NASA, Air Force, Navy, the Applied Physics Lab and other control systems. For many years I was either the only woman or one of two in my department or project teams. I had never worked with women technical managers before coming to Sandia. I had seen women in business roles or accounting, but none in senior engineering fields. Lorraine Baca hired me into Sandia to work on the Integrated Correlation and Display System program. She was the first woman technical manager I had ever worked with. She was a wonderful mentor and role model. At Sandia I saw women in many leadership positions. There is no comparison to my prior employment where I saw very few women in technical leadership roles."

— Janice Smith, manager, system engineering



LEADER IN STEM — Janice Smith says she is proud to work at Sandia, where she believes women have many opportunities to pursue technical leadership positions. Her first Sandia manager, Lorraine Baca, served as a mentor and role model to her when she joined the Labs in 2004.

Photo courtesy of Janice Smith

Reusable respirator

CONTINUED FROM PAGE 1

Although the [Centers for Disease Control and Prevention](#) has recommended ways to safely stretch depleted supplies, rationing during a pandemic is rarely ideal. Reusing masks can increase health risks to the wearers, and prolonged use can cause acne, sores and rashes. Even using conservation strategies, demand for personal protective equipment still can outpace supply.

"The COVID-19 pandemic has uncovered bottlenecks in the development, generation and distribution of PPE that is safe for our medical community and is forcing the risky reuse and unsafe invention of stop gap PPE," Todd said.

Sandia's prototype has been designed for extended, repeated use, meaning hospitals might need only one respirator for each worker.

The mask can be completely disassembled for cleaning between uses. It gently distributes its weight across the whole head. It filters both inhaled and exhaled air with replaceable N95 material stored inside two disc-shaped cases, protecting wearers and patients. A resonator, like the one on the end of a stethoscope, amplifies the wearer's voice for unstified communication.

Preliminary test results at Sandia show promise that the mask can meet safety standards set by the National Institute of Occupational Safety and Health, the organization that certifies masks as N95. Further

studies are needed to determine how long the mask can be comfortably worn.

Sandia is pursuing partnerships to help complete the testing phase and assess cost-effective production methods. If the research shows the mask meets certification requirements, Sandia plans to license the design to manufacturers.

Retooling labs to create and test prototypes

A medical respirator might seem an odd thing for a national security lab to make, but when COVID-19 struck, Sandia's extensive facilities and staff expertise were up to the task.

"We can test the respirator fit and filtration applying the same rigor as required for NIOSH certification. Additionally, we can

rapidly build prototypes on-site and can perform studies on the fit and performance to quickly get feedback on the mechanical design,” Todd said. “We are fortunate to have incredible scientists on our team that can analyze decontamination and sterilization of the respirator structure.”

Seventeen researchers put their wide-ranging experience into the design, including mechanical engineers, microbiologists, virologists, materials scientists, fabrication experts and Michael Omana, an aerosol scientist.

An aerosol is a mist of particles or droplets, like hairspray, fog or a

virus-laden cough. But at Sandia, aerosol science is a means to detect biological agents in an explosion, contain the spread of chemical vapors or measure airborne particles that betray hidden nuclear weapons programs.


“We take an often-overlooked aspect of day-to-day life, a common phenomenon, and apply it to national security fields,” Michael said.

When respirator shortages began making headlines, Michael and his colleagues responded to the national need by retuning their equipment for COVID-19

research. In addition to helping with the respirator design, Sandia’s aerosol teams led 11 pandemic-related projects in the last year, many of which [tested mask materials and decontamination methods](#), and have lent support to more projects led by other labs.

“We’ve learned a lot about what works and what doesn’t in terms of structure, materials and production methods,” Todd said. “We’ve also learned that Sandia can quickly assemble a team with all the skills needed to develop and test medical-grade respirators.” [f](#)

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