Gerry Yonas retires
Sandia VP and Chief Scientist
Gerry Yonas is retiring after a Labs career of almost 35 years. But he says he’s not really retiring; rather, he’s moving on to a new area of inquiry: the human mind. Read about Gerry’s career and future plans on page 6.

Essay contest winner
Sam Felix (10640) has won first place in an essay contest sponsored by Lockheed Martin’s Hispanic Leaders Committee. The topic: “Being a Hispanic at Lockheed Martin means . . .” Read Sam’s winning essay on page 2.

Somewhere in the world on Oct. 9, 2006, a low-yield nuclear device exploded underground.
In 48 hours, the sensors of the Comprehensive Nuclear Test Ban Treaty’s (CTBT) International Monitoring System (IMS) — globally distributed — were able to pinpoint the location of the blast to an underground area in North Korea only 10 kilometers across.
The ability to detect and quickly pinpoint the location of the relatively small explosion — many times smaller than the Hiroshima bomb — suggests that any gaps in worldwide sensing capabilities have diminished greatly over the past decade, say Sandians involved in global efforts to detect nuclear explosions wherever they may occur.
This year, in response to President Barack Obama’s April 5 speech in Prague in which he stated that his administration would seek CTBT ratification “aggressively and immediately,” a team of five Sandians journeyed to Vienna to the CTBT Organization’s (CTBTO) International Science Studies Conference. The Sandians presented three posters that demonstrated improved technical capabilities to detect underground nuclear blasts.
“We went there,” says Tim McDonald (5736), “to reestablish our presence in an international community rejuvenated since the president expressed his determination to get the CTBT ratified. I was surprised by the intensity of the reaction to President Obama’s outreach. The interest level was astounding.”
Tim was also “very pleased with the number and quality of scientific presentations.”
The Sandians were, besides Tim, Christopher Young (5527), Sandy Ballard (5527), Joe Damico (6723), and Jim Arzigan (6723).
In addition to showing the world computationally A C. elegans solution to clearance sampling
CATHY BRANDA watches for fluorescent expression in a strain of C. elegans that, with a little work, may someday be used for on site clearance sampling. (Photo by Randy Wong)

A C. elegans solution to clearance sampling
By Patti Koning
After a biological attack, how do recovery teams know for sure that a site is sufficiently decontaminated and safe once again for people? Turns out, it’s not an easy or fast process, but one that biologist Cathy Branda (8621) is hoping to revolutionize with a rather amazing nematode, Caenorhabditis elegans.
Cathy is working with Mark Tucker (6327), who for many years has led Sandia’s efforts in developing methods, procedures, and technologies to remediate facilities contaminated in a terrorist release of a biological agent. Mark’s team found that testing for residual live virus or bacteria following initial decontamination efforts, a process called clearance sampling, can be the longest step in the remediation process. Detection of residual live virus is particularly problematic and time-consuming, as it requires evaluation of replication potential within a eukaryotic host such as chicken embryos.
Currently, clearance sampling involves collecting swab samples from across a site and transporting them to a suitable laboratory for measurement of biological activity. Depending on the agent, the samples may need to be processed at a biosafety level 3 or 4 laboratory. In the aftermath of the Senate anthrax attack of 2001, the US Army Medical Research Institute of Infectious Diseases it only looks like Star Trek — Joe Sanders (5924) examines the shell of a next-generation airborne radionuclide particle collection pod designed at Sandia. The pod’s sensors detect short-lived radionuclides released into the atmosphere in the wake of an underground nuclear detonation. The modernized system replaces technology dating from the 1950s and 1960s. (Photo by Randy Montoya)
That's that

Out in some of our more remote areas, you'll sometimes see signs warning people to watch for snakes. Zounds! It's enough to make you wonder how we ever got along without rattlesnakes. But that's what we have to put up with. Signs telling visitors not to pick them up! Here's what happened: A week ago some of the folks from my group escorted some visitors to a presentation in the parking lot near his back door. After a presentation, one of the visitors noticed a three-foot rattle snake lying right in the parking lot, sunning itself. The guy gets very animated, drops like a rock, and runs back to his back door. The snake, the escort, getting rather alarmed says, "W-what are you doing?" "I'm gonna catch that rattle snake," the guy says. To which our well-trained, safety-conscious escort says, "Like heck you'd have to do that, it's our federal property. You can't just go around picking up rattle snakes." The guy, visibly deflated, gets back in the bus. I guess he maybe intended to put the snake in his backpack and take it home. There's no punch line here, but people can be funny sometimes. Funny strange.

Not long ago, a survey conducted by Marist College asked people which phrases in common English usage annoyed them the most. The results - at the end of the day - were interesting. Anyway, they were interesting enough or humorous enough - whatever - to generate a bit of national media coverage. Nowadays, though, I find that the media get interested in the most unlikely and inconsequential things, you know! I mean, how can you really make a story out of the phrases that annoy people most? The English language isn't exactly static. It evolves. It is what it is.

By the way, in the paragraph above, I was able to work in the top five annoying phrases. I must have more I toss in to the mix. I'm still looking for the detractor and the participant interviews. Nobody, but nobody, slings a cliché like a sports announcer, coach, or player.

Of course, it's easy as pie to get some cheap laughs in a column like this by tossing out a few very clichés and holding them up to ridicule. I won't do that, though. If the truth be told, I find those recurring sports truisms to be rather comforting. It's nice to know, isn't it, that there's won't do that, though. If the truth be told, I find those recurring sports truisms to be rather comforting. It's nice to know, isn't it, that there's

Say, did you see that note in the Sandia Daily News a few weeks back? The one about green burials? It was filed as an environmental tip. Turns out that modern American burial practices aren't all that environmentally friendly and that an effort to green up the process, sort of a return to the days of the pine box and no preservatives. Sounds fine and reasonable to me. I don't quit in him. It's enlightening to find out that your team has to put some runs to be rather comforting. It's nice to know, isn't it, that there's

Thunderbirds club meets Dec. 8

The Coronado Thunderbirds, Sandia's retiree club, will meet in its regular meeting Dec. 8, at the Mountain View Club on Kirtland Air Force Base. The meeting will include a presentation on making Christmas decorations. Many of the demonstration projects at HBE. Details will be given as door prizes. A holiday sing-along will follow the meeting, with Eddie Reyes playing guitar. Viewing HR information, Benefits Open Enrollment, cards, and applying for a job are just a few examples of PeopleSoft's functionality. The upgrade will modernize

For the record

Brent Burdick (1031) was inadvertently left off the list as an early leader in the NINE project in the article "Sandia, SRC win Licensing Executives Society award (May 29, 2009)." It didn't say exactly static. It moves. It evolves. It is what it is.

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Sandian Sam Felix wins Lockheed Martin essay contest

Note: Sam, a senior manager in Dept. 10340, Div. 40008, Business Operations, was awarded first place in the essay contest sponsored by Lockheed Martin. The essay contest was titled, "Looking back, how do you think the business in which you are employed will evolve?" The essay topic was "Being a Hispanic at Lockheed Martin.

The contest was held in observance of National Hispanic Heritage Month (Sept. 15-Oct. 15). Here is Sam's essay:

Sam Felix

Lockheed Martin has allowed me to work for three very different business units, where I have grown as a technical expert and a leader. It is exciting to know that the job I do will be seen by a tiny boy from a small town in southern New Mexico can have the opportunity to become a leader for the largest defense contractor in the country.

Of course throughout my career I have worked hard and sought out opportunities to be a better employee, but it is through the eyes of other leaders that I was nourished and then fertilized. I was given the latitude to succeed regardless of my ethnicity. What I have realized in this stage of my career is that I am being watched by everyone. My management style, the way I deliver my, my teammates evaluate my ideas and contributions, my peers encourage me to test my limits, and subordinates value my input and value my advice. I believe I could go back to each of those team members and they would all say that we accomplished something larger than we imagined.

As with any career, I have encountered my fair share of challenges. For me, first impressions have usually been difficult given my heritage, which tends to play down itself within the culture. Thankfully, my director recognized that cultural trait and continues to mentor me through this challenge.

When I think of Hispanic at Lockheed Martin, I hope no different to any other ethnicity working for this great company. When I see other staff members or leaders I look for their value of contribution and leadership. That is exactly what I hope others look for in me. Professionally, I want to be known as a leader, a coach, a trusted business partner, a technical expert, and a role model. My teammates evaluate my ideas and contributions; my manager examines my process and delivers back to each of those team members and they would all say that we accomplished something larger than we imagined.

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C. elegans

(Continued from page 1)

tious Diseases (USAMRMC) performed more than 30,000 individual assays on more than 10,000 samples, processing more than 700 per day at the peak. The Hart Senate Office Building was closed for three months, more than half of which was for clearance sampling. Many facilities affected in the attack were closed for years. While closing office buildings and postal facilities is of relatively low consequence — the work can be moved elsewhere — the closure of a major transit center such as an airport could have devastating economic impact.

“As all of our prior work on remediation has shown, the time required for clearance sampling really limits our ability to return facilities or even entire cities to operation,” says Duane Lindner (8120). “Having a rapid method of clearance sampling would relieve a fundamental roadblock to rapid restoration.”

Cathy’s answer is to turn C. elegans loose on the problem and perform clearance sampling on site using the nematode. This Laboratory Directed Research and Development (LDRD) project is attempting to use modified C. elegans that would fluoresce in the presence of live virus. Clearance sampling could be as simple as spreading a C. elegans-laden gel on the affected area and shining a UV light to see if the virus had initiated replication within the animal. Remediators could have their answer in as little as eight hours.

“To revolutionize this process, you need to bring the host to the site of contamination and have an on-site, rapid assay process so you don’t have to take swab samples, transport them to a laboratory, or do culturing,” she says. “That’s the utility we are trying to bring to C. elegans.”

Naturally, this process is easier said than done. But C. elegans, scientists say, is an incredibly maneuverable creature (6327). Virologist Oscar Negreti (8621); data analyst Joe Schoeniger (8621); and laboratory technologists Julie Kaiser (8621, year one) and Carrie Koyna (8625, years two and three) — can leverage what is already known about C. elegans and viral replication. They will also draw on Mark’s work with decontamination foam to developing the gel.

A worm by any other name

Let’s get one thing straight: C. elegans are roundworms, but they aren’t the parasitic sort that can make people sick. In fact, C. elegans, which are present in large numbers in the environment all around us, have already made significant contributions to medical research.

C. elegans is one of Cathy’s (along with many other scientists’) favorite lab animals for a number of reasons. Despite being just a millimeter long, they are multicellular organisms with complex biology and a well-developed nervous system. They are genetically well-characterized, optically transparent, and replicate in just a few days, producing large brood sizes.

Another advantage of C. elegans is that they are eukaryotes, sharing cellular and molecular structures and control pathways with higher organisms. That’s not all it shares — about 35 percent of the little worm’s genes have human homologs, or, in other words, common ancestry.

They are extremely adept at living in harsh environments and even have an alternative life form called the dauer larval stage, in which they can survive without food or water for months. C. elegans survived the space shuttle Columbia disaster in 2003. This heartiness poses a problem for Cathy’s grand plans — while they are susceptible to infection, they also have a strong antiviral defense down a notch. They are also working with Creg Darby, an assistant professor at the University of California, San Francisco, who is using C. elegans to research biofilms of Yersinia pestis, the causative agent of bubonic plague. Darby has shared a library of identified mutations that render the cuticle fragile.

Shine a light

The other half of the C. elegans solution is to modify the animal’s metabolic signaling pathways with a “molecular tag” so that when a specific virus replicates within it, the animal acts as a sensor and fluoresces. Again, the team has the advantage of previous research, but still needs to break new ground.

The team is testing a large number of C. elegans mutants and experimenting with different chemicals and pressure gradients to see if they can take those natural defenses down a notch. They are also working with Creg Darby, an assistant professor at the University of California, San Francisco, who is using C. elegans to research biofilms of Yersinia pestis, the causative agent of bubonic plague. Darby has shared a library of identified mutations that render the cuticle fragile.

The team is testing with mKate2, a fluorophore that fluoresces red when exposed to green light. Since most background autofluorescence glows green when exposed to blue light, similar to the popularly used green fluorescent protein (GFP), the team’s use of mKate2 should help to eliminate false positives.

As a proof of concept, Oscar is developing molecular tags for two viruses: Rift Valley fever virus (RVFV) and vesicular stomatitis virus (VSV). Here at Sandia, he’s using attenuated, nonvirulent strains that fully conform to Sandia’s rigorous biosafety requirements.

Getting the molecular tag into the animal is not the difficult part — reading it is. “Because C. elegans is only a millimeter long and we are talking about a subset of their cells, the ability to amplify the signal is critical if we are going to be able to detect it,” says Cathy.

Fortunately, another of C. elegans’ talents is communication via a pheromone-signaling pathway. The response of the animal depends on the pheromone concentration it detects — enough will send it into the dauer state. This trigger involves an insulin receptor pathway similar to that found in humans, so it has been studied extensively.

The idea is to manipulate the C. elegans so that it produces the dauer signal in cells that have been infected. Instead of sending the recipient into the dauer state, the modified signal would trigger an amplification of the fluorescent response. “While much is known about this trigger, no one has tried to take advantage of its properties for an application,” Cathy says. “To trigger the amplification of the signal is novel, and determining the right way to do that is a challenge.”

Many milestones

By the end of the LDRD project, Cathy aims to have modified strains of C. elegans that can be used as sensors for RVFV and VSV. Her other objective is to develop sufficiently immune-compromised C. elegans. Between these goals and where the researchers are now, there are several significant milestones.

“Even if we can’t render the C. elegans susceptible enough for clearance sampling, the strains we will generate will still be useful tools for both homeland defense and research,” says Cathy. For example, she envisions a pool of C. elegans sensor strains that could be used to quickly identify the viral agent employed in an attack.

The immune-compromised C. elegans could also serve as a model to study questions such as how a virus spreads through tissues, what tissues are targeted, the receptors for viral infections, and mechanisms for limiting infections.

She’s also excited about the potential to share the research within Sandia. C. elegans are an incredibly useful tool that could be applied to many research areas relevant to Sandia’s missions, including cell-cell signaling, genomics, proteomics, environmental and particle toxicity, identification of antimicrobial and antifungal agents, etc.

“There is a lot of excitement about this project because it is such a fresh approach. If it works — and there is every indication that it will work — this clearance sampling method will revolutionize restoration.”

Duane Lindner
that global sensing of an underground nuclear explosion is a reality, Sandia also is responsible for ensuring the proper installation and testing of US-sponsored CTBT International Monitoring System stations. Randy Rembold (5736), the US configuration manager in these efforts, described a personal letter of commendation from the CTBTO to prove it.

Finally, Sandia has actively worked to improve the key event of nuclear test confirmation: airborne monitoring of nuclear debris.

"An impressive though unusual venue" In what Tim McDonald described as "an impressive though unusual venue" (known as the former emperor’s palace in Vienna — 400 researchers, diplomats, and foreign service personnel from many countries convened to present new findings on methods of detecting underground nuclear explosions.

The meeting’s technical exchanges were intended to advance efforts to achieve effective prompt reporting of an underground explosion because thousands of shocks a day pass through the Earth.

"The idea is to combine computing, signal processing, and sensors to achieve the goal of being able to detect a nuclear weapon anywhere in the world without it being sensed," says Tim. "Sandia is very much a leader in this." While Sandia routinely assists the National Data Center (NDC), "We’re also exploiting work with the International Data Center (IDC) to help them do as good a job as they can. It’s in our national interest," says Tim.

One Sandia poster, sponsored by NNSA’s Office of Nonproliferation and International Security (NA24), titled “Simulations of IMS Detection Effectiveness as Deployed vs. Planned,” was a kind of map intended "to show the world that we could detect an illegal test," says lead Jim Arzigan. "We made a map to show how well we can detect explosions around the world.

The map program is simple enough to run on a laptop. It models information obtained from the four main technologies: seismic monitoring, infrasound sensing, hydroacoustic (water), radionuclide (radioactive materials), seismic (earth), and infrasound data (air).

"We had a very benign statement on our poster that we wanted to make an announcement to the international community," Jim says.

"Accurate interpretation of seismic events is crucial because thousands of shocks a day pass through Earth’s crust. With this background knowledge, sensors and programs have had to locate the two detected nuclear explosions that occurred during the last decade with the greatest accuracy," he says.

A third poster, "Applying Machine Learning Methods to Improve Efficiency and Effectiveness of the IDC Automatic Event Detection System," by Christopher Young, Michael Procopio (both 5527), and Jack Gaither (6342), described a method to improve the rapidity and effectiveness of interpreting seismic data of interest.

Sandia helps install sensing stations

More than 80 monitoring stations around the world make up the International Monitoring System that collects data for verification of the CTBT. Of these, the US is responsible for 17: five primary seismic stations, 12 auxiliary seismic stations, 11 radionuclide stations, eight infrasound stations, and one hydroacoustic station.

Randy Rembold, configuration manager for all the International Monitoring System stations in the US, received an individual acknowledgement from CTBTO Radionuclide Engineering Officer Luis Cello for Randy’s service in installing and assisting in the certification of these stations.

An integration configuration manager ensures that stations meet the technical requirements of the CTBT in Vienna, allowing these stations to be certified by the CTBTO. Once so certified, the data from an IMS station can be accepted and processed by the International Data Center (IDC).

The occasion for praise was the certification of a Midway Island radionuclide particulate station that was the final US agreed-upon station to monitor radionuclide particles, "making [the US] the first nuclear-weapon state and the second of those having four or more tests to accomplish such a goal," wrote Cello. "Congratulations to all for the excellent job, especially . . . Randy Rembold, who took part in all the certifications, always supporting the PTS [Provisional Technical Secretariat] staff before, during, and after the certification visits.”

Randy has visited almost every US station from Antarctica to the Arctic, including sensor sites on Guam, Midway Island, Wake Island, Alaska, and Hawaii.

"We’re in the shadows, our name doesn’t get mentioned," he says of Sandia’s involvement. "We don’t run the stations, we just certify that the stations meet CTBT design and operation specs.

As a part of the triad, Sandia conducts both system and component testing, currently done by Darren Hart (5736) at each of the stations. Randy says that "Sandia is key to this effort, and the greatest information we have comes from the background trend, and the ground, the signature, and system evaluation performed there." A digital filter is the heart of a data acquisition system that measures a voltage signal, converting it into a binary file consisting of ones and zeroes. Because seismic signals of interest may be quite small with respect to the background, the digitizers have very high resolution, usually with the capability of resolving one part in 16 million of the full-scale signal.

Airborne nuclear debris collection, analysis

The gold standard for confirming that an explosion occurred is by seismic, hydroacoustic, or infrasound sensors. If of nuclear origin is by detection of short-lived radionuclides produced by the event.

Historically, aircraft equipped with special collection equipment have been the most effective at accomplishing this task. Aircraft have the mobility to fly “downwind” of the event, which may require searching over a broad ocean area. Fixed land-based radionuclide sensors do not have this option, and might not be located in the path of the debris plume.

Airborne evidence is difficult to mask, says Joe Sanders (5924). Even when the scrutinized nation goes to great lengths to conceal the radioactive explosion products from an underground nuclear test, telltale radionuclides can still leak out and be detected downward.

Radioactive debris from poorly contained events often escapes immediately and in large quantities, making airborne collection and detection quite feasible. While into the current decade, the primary US aircraft nuclear collection capability consisted of nuclear debris collection and analysis equipment developed in the late 1950s and early 1960s. This equipment was installed on military aircraft, which underwent extensive post-deployment modifications to carry the bulky equipment. This re-computerized era equipment used vacuum tubes and chart recorders and required pencil-and-paper data logging. In the late 1990s, Sandia was tasked to develop an upgraded airborne sampling suite to replace the still-operating 1960s-era system.

The fully computerized system, which went operational in 2004, represented a major modernization over the earlier system, but “it still required permanent modifications to the aircraft,” says Walt Caldwell (5923).

The modular solution

Recognizing that permanent modifications to aircraft are expensive and limit the number of platforms on which sampling systems can be flown, Sandia has been developing modular hardware since early this decade. The currently favored modular solution consists of pods that can be attached on hardpoints beneath the wings of manned or unmanned aircraft, says Joe. Research to develop and test these pods has been supported by NA-22 and DoD.

To date, Sandia and its Albuquerque industrial partner MechTronic Solutions, Inc., have developed technology demonstration units for three types of pods: a partellite collection pod (known as ARCS), a whole air sampling pod (known as WASP), and a directional gamma sensor pod (known as DGRS) that can identify the direction of peak radiation intensity in the nuclear debris plume. "The ARCS pod has been successfully tested on both manned and unmanned aircraft," says Joe.

 Says Bob Huelskamp (5730), "Sandia is a great example of what a national lab can do in support of a presidential objective to improve world security."
When was the last time you saw a crew of 30 to 40 young people with a tractor pull up in front of your house? They then proceed to winterize it, tear up grass in your backyard, and put in rock landscaping. In addition to all that, they put up a fence, add a gate, pull weeds, and clean out a work shed.

Imagine all this work; then they leave and there is no bill. Who are these people? Where did they come from? That is exactly what happened recently when members of Sandia's Protective Force prepared Judith Carrillo's home for the winter. Judith's husband Phillip had been a member of the Pro Force and in September lost his three-year battle with prostate cancer. Phillip was 44 years old when he died and in addition to Judith is survived by his sons Phillip, 12, and Bryan, 6.

"We often look to television to find heroes," says Phillip's sister-in-law, Diane Nakos (3503). "Most of us pass by Sandia Security Police Officers every day and pay little attention to who they are. They are heroes to my family."

"Phillip was incredibly proud when he was hired by Sandia and eventually became part of the Special Response Team (SRT)," says Diane. "Little Phillip and Bryan thought their dad was a hero for working at a national laboratory and wearing 'a special uniform.'"

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"Phillip was the last time you saw a crew of 30 to 40 young people with a tractor pull up in front of your house? They then proceed to winterize it, tear up grass in your backyard, and put in rock landscaping. In addition to all that, they put up a fence, add a gate, pull weeds, and clean out a work shed. Imagine all this work; then they leave and there is no bill. Who are these people? Where did they come from? That is exactly what happened recently when members of Sandia's Protective Force prepared Judith Carrillo's home for the winter. Judith's husband Phillip had been a member of the Pro Force and in September lost his three-year battle with prostate cancer. Phillip was 44 years old when he died and in addition to Judith is survived by his sons Phillip, 12, and Bryan, 6.

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"The Pro Force carried Phillip in every way," says Judith. "At the funeral celebration, members of the Pro Force were at the end of the procession taking him for his final ride. They carried him in more ways than they knew."

"Phillip's family is not the only family helped by the Pro Force. If one of their members needs help, the Pro Force is there. Phillip wanted to go help when he heard that they were cleaning up someone else's place even though it was not possible."

"Phillip was a sensitive romantic," says Diego. "He would always tell us 'No matter what you are doing or how busy you are, there is always time to take a moment, look to the west, and enjoy a beautiful sunset with someone you love.'" Phillip was special."
By Neal Singer

Sandia VP and Principal Scientist Gerry Yonas is retiring from Sandia on Dec. 1 — but he's not retiring. It's not a loan [a paradoxical anecdote], says Sandia's creative vice president, sometimes referred to as Yoda and Yonastradamus by Sandia staff for his occasionally startling intuitions into the shifting directions of future research. "I've given myself five years to master the next challenge — the rules by which the brain functions and how to influence it . . . or maybe not."

That Gerry chooses to move on to investigating the brain (in conjunction with the Albuquerque-based Mind Research Network) rather than simply fade away into brain (in conjunction with the Albuquerque-based Mind Research Network) rather than simply fade away into brain

how to influence it . . . or maybe not."

"I thought I would be there [at JPL] my whole life," he says, quoting Ronald Reagan "and a house and I got fired."

He foresaw magneto-fluid dynamics, imaginary magneto-fluid dynamics, only to be fired a year later. "The reason I got fired was that the Ranger spacecraft crashed into the moon many times and failed to take even a single photo on the way," he says. Images were needed to gather evidence for the upcoming landing of Apollo 11 a few years later. "Everyone not contributing to that effort was considered surplus."

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"It wasn't there. "It wasn't to be there," he says. "It's hard to measure and modify brain function. Theoretical modeling will be very important. Major advances soon will take place in this field."

Gerry intends to be there, helping lead the way into the future. And it was there, working at the Jet Propulsion Lab, "so I could use my research results there for my doctoral work."

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I have ever gone camping and slept in a tent, you know it is fun for a while. A tent was Mike Arviso’s (1952) home as a toddler.

Mike was born in Shiprock, N.M., and was raised by his aunts and uncles in addition to his dad and mom, Paul and Hazel. Mike and his family moved to an apartment before living in a mobile home. Three years ago Mike and his sister and three brothers built his mom and dad their first home.

I went to school in Farmington,” says Mike. “My parents knew how important it was for us to go to school. My father attended school up until eighth grade. My mom went to second grade. My father worked on cars. He was what is called a body man. He restored vehicles to their original condition.”

One day while he and his friends were playing basketball, the principal pointed to each of the boys and told them what they thought they were going to be when they grew up. When he pointed to Mike, he told him he was going to be an electrical engineer. Even though Mike was only in second grade, it stayed with him. At first Mike thought an engineer drove an electric train.

When my son and daughter were growing up, my dad would always say we must pray to God and pray to the Navajo Nation. It was through this that I learned how to learn about our culture, says Mike. “I grew up in the reservation.”

“My parents live about three hours away,” he adds. “I enjoy going back to the reservation,” says Mike. “I feel like I am actually home on the reservation. I get to see not only my family, but my extended family. “My parents live about three hours away,” he adds. “I enjoy going back to the reservation,” says Mike. “I feel like I am actually home on the reservation. I get to see not only my family, but my extended family.”

“nizhoni” is a term meaning “beautiful” in Navajo, says Mike. “That is perfect. I get to stay close to my roots. “That is perfect. I get to stay close to my roots.”

“The ceremony was held in Red Mesa, Ariz., where Mike and his family reside. The four-day ceremony introduced Brittany to intricate weaving, food preparation, and beading and she got to hear many stories. She was cautioned — don’t grow up too fast. Her maternal mother and grandmother made her outfit.

“The experience put me back in touch with my culture. I enjoyed seeing Brittany go with the flow as she learned how to harvest, grind, and steam corn the old way, to store for the dry winter months. Brittany’s only wish during her ceremony was hoping she could talk in Navajo to communicate with her mother more closely. Although my mother speaks English she prefers Navajo. “That is perfect. I get to stay close to my roots.”

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The event was sponsored by Sandia’s American Indian Outreach Committee.

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With the line of hungry Sandians waiting for Indian fry bread, Navajo tacos, and other popular fare stretching almost half the length of Hardin Field, Red Road Crossing Drum Group and Dancers performed a number of familiar and original music numbers, including the riveting favorite “Soldier Boy” by Dick Chavez-Altuna (2997), master of ceremonies for the day’s events, kept the activities moving smoothly, his comments helping to keep the focus on the nation’s veterans and American Indian heritage.

After presentation of the colors and the Pledge of Allegiance, guest speaker George Bhuyan of the Sandia varsity football team delivered a speech to three generations of his family who have served in the armed forces. George spoke of the service of his father, a World War II veteran now residing in Las Vegas, Nev., his wife, who flew helicopters for the Army during the waning days of the Cold War, his son, an Army officer currently deployed to Afghanistan; and his daughter, an Air Force officer stationed in Virginia. George, director of Public Relations and Communications Center 3606, is himself a veteran, having served as a colonel after nearly 27 years in the Army.

“Service is not easy.” George told the audience. “It requires determination and stick-to-itiveness. It challenges you in ways you can’t imagine, and it challenges those around you. I could never pass along this message without also recognizing the amazing support structure that our service members get from their families and the American public.”

With costumed dancers displaying elegant footwork in dazzling swirls of color, and with the sounds of drums and singing rising up from the field, the hundreds of attendees were transported to a timeless place, able to contemplate our ancestors.

In an emotional high point of the day, Curtis Keliaia (9336) recited a poem of his own composition. He dedicated the poem, “Brothers in Arms and Glory,” to his father and uncle, who both served in World War II, and to all veterans who have served the nation. As the crowd grew silent, his poem began, “Brothers in arms and glory/forever honor bound/God bless the blood of our fathers/spilled on sacred ground.”

Also performing during the day were the Sandia Singers and popular American Indian flutist Ron Hoskie (4842), whose haunting flute rendition of Amazing Grace wrapped up the formal activities.