By Troy Rummler

Los Alamos and Lawrence Livermore national laboratories expect to develop an improved software-and-tools environment that will enable mission codes to make increasingly effective use of Astra as well as future leadership-class platforms,” says Ken Alvin, senior manager for extreme-scale computing. “The Vanguard program is designed to allow the NNSA to take prudent risks in exploring emerging technologies and broadening our future computing options.”

Astra will be installed at Sandia in an expanded part of the building that originally housed the innovative Microelectronics and Solid-State Technology Facility, now called the Microsystems Engineering, Science and Technology Laboratory.

Astra’s compute, cooling, network and data storage cabinets. Illustration courtesy of Hewlett Packard Enterprise.

Astra has been deeply engaged with Sandia National Laboratories working to comprehend and deliver on the needs of the high-performance computing community. We are eager to support the Vanguard program as a key milestone deployment for Arm and our partners, delivering on a shared vision to spur innovation in this critical domain.”

Drew Henry, senior vice president and general manager of Arm’s infrastructure business line

A computer-automated design conception of Sandia’s Astra supercomputer, used to work out the floor layout of the supercomputer’s compute, cooling, network and data storage cabinets. Illustration courtesy of Hewlett Packard Enterprise.

DOE to deploy Arm-based supercomputer prototype at Sandia

By Neal Singer

Microprocessors designed by Arm are ubiquitous in automobile electronics, cellphones and other embedded applications, but until recently they have not provided the performance necessary to make them practical for high-performance computing. Arm, one of the first supercomputers to use processors based on the Arm architecture in a large-scale high-performance computing platform — is expected to be deployed at Sandia later this summer.

The DOE’s NNSA announced that Astra, the first of a potential series of advanced architecture prototype platforms, will be deployed as part of its Vanguard program. Vanguard will evaluate the feasibility of emerging high-performance computing architectures as production platforms to support NNSA’s mission to maintain and enhance the safety, security and effectiveness of the U.S. nuclear stockpile.

“One of the important questions Astra will help us answer is how well does the peak performance of this architecture translate into real performance for mission applications,” says Mark Anderson, program director for NNSA’s Advanced Simulation and Computing program, which funds Astra.

Astra will be based on the recently announced Cavium Inc. ThunderX2 64-bit Arm-v8 microprocessor. The platform will consist of 2,592 compute nodes, of which each is 28-core, dual-socket. Its theoretical peak will be more than 2.3 teraflops, equivalent to 2.3 quadrillion floating-point operations per second. While being the fastest machine is not one of the goals of Astra or of the Vanguard program in general, a single Astra node is roughly one hundred times faster than a modern Arm-based cellphone.

A first step for Vanguard

Astra will be installed at Sandia in an expanded part of the building that originally housed the innovative Microelectronics and Solid-State Technology Facility, now called the Microsystems Engineering, Science and Technology Laboratory.

Astra researchers partnering with counterparts at the NNSA administrator met with labs executive leadership to discuss the nuclear weapons modernization program, upgrades to NNSA and hypersonics. She also toured the neutron generator facility, Z Machine, and the annular core research reactor. Following her visit to Sandia, she continued on to the Nevada National Security Site.

Lisa Gordon-Hagerty, DOE under secretary for nuclear security, signaled strong federal support for Sandia’s mission and infrastructure improvements, speaking in Albuquerque on June 12. The meeting was part of an all-day tour of the Labs. This was her first visit to Sandia New Mexico as under secretary. She toured Sandia’s California campus six weeks ago.

In her remarks, she championed recent and proposed budget increases. “Our work is cut out for us, but finally we have been given the resources to do it,” she said. Gordon-Hagerty voiced a strong commitment to modernize aging infrastructure. She also discussed plans to break ground soon for the $174.5 million NNSA Albuquerque Complex, which Congress authorized in April, an announcement met with applause.

She made reference to a long-term plan for renewal of Sandia’s Microsystems Engineering, Science and Applications complex, saying the administration is “ensuring the U.S. ability to produce secure, radiation-hardened microelectronic systems beyond 2025.”

Another top priority that Gordon-Hagerty noted was investing in people and teams. She said NNSA will increase investments in professional development programs and in building a stronger pipeline of young talent. Fielding questions following her remarks, Gordon-Hagerty acknowledged the difficulty of competing with private-sector salaries and affirmed her department’s desire to correct disparities as much as possible.

Sandia achievements that received praise included the completion of TSS nuclear deterrence milestones, delivering new radiation detection equipment for U.S. arms control treaty inspectors and new formal processes that improve the readiness of responders to nuclear accidents or incidents.

Ms. Gordon-Hagerty was sworn in in February. She has more than 30 years of national security experience, including 12 years with the Defense Department as director, or the Defense Threat Reduction Agency, or the Defense Nuclear Nonproliferation Program. During her tenure, she directed the Defense Nuclear Nonproliferation Program, which funds Astra.

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Scott Collis, director of Sandia’s Center for Computing Research, says, “Emerging architectures come with many challenges. Since the NNSA has not previously deployed high-performance computing platforms based on Arm processors, there are gaps in the software that must be addressed before considering this technology for future platforms much larger in scale than Astra.”

As part of a multilab partnership, researchers anticipate continually improving Astra and future platforms.

“Sandia researchers partnering with counterparts at

THE NNSA Administrator Gordon-Hagerty says she took its name from the Latin phrase “per aspera ad astra,” or “through difficulties to the stars.”

DOE to deploy Arm-based supercomputer prototype at Sandia

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New speaker series addresses vital local issues

By Stephanie Holinka

Bernalillo County District Attorney Raul Torrez gave a Bernalillo audience some sobering facts at the inaugural session of the Community Engagement Speaker Series.

“The reality is, you’re living in a community with a very serious crime problem,” Torrez said.

Torr佐 discussed crime in the Albuquerque metro area and how past anti-crime efforts have fallen short, and he introduced a few ideas, including ways to ameliorate the early childhood trauma that often turns someone toward crime. Community Involvement and Associate Director for Mission Assurance Mark Sellers hosted the session at the Schiff Auditorium.

Torr佐 said between 2014-2016, Albuquerque experienced the greatest increase in crime of any of the 30 largest U.S. cities, according to the FBI’s Uniform Crime Reports.

In that two-year period, Albuquerque showed a 26 percent increase in violent crime, violent crime and property crime, and a staggering 102 percent increase in car thefts, making it the No. 1 U.S. city for auto theft.

Also alarming, Torrez said, is that crime rates are coming down in most larger cities, while Albuquerque’s continues to rise.

Torr佐 said one barrier to addressing the problem is shortcomings in the system of investigating crimes and processing criminals, which is organized chronologically based on the court system calendar — not the most efficient way to fight crime or assign risks for future crime, he said.

“Most is that the most dangerous person in an investigator’s stack of cases to be investigated could be a 20-cases deep. Right now there’s no way to address that,” Torrez said.

Crime in Albuquerque hits close to home for Sandia/New Mexico. The International District, located just north of the downtown area, has the greatest concentra-

Shortcomings in the system of investigating crimes and making it the No. 1 U.S. city for auto theft.

percent increase in all crime, violent crime and property crime in U.S. cities, according to the FBI’s Uniform Crime Reports.

Torr佐 said his office doesn’t have a way to share electronic information with other parts of the criminal justice system due to system incompatibility, which leads to collaboration problems.

“We still use WordPerfect,” he told the shocked crowd. A Sandia researcher has been working with Torrez’s office to find ways to improve data analysis and visualization.

The office has hired a programmer to help address some of the data sharing and analysis problems.

Overall, Torrez’s office is looking for ways to focus on the small number of people who commit the most crimes.

The goal, Torrez said, is that “if you’re going to be a prolific overperforming criminal, you’re entitled to your own personal prosecutor. We’re going to strive for VIP service.”

In addition to focusing time and resources on those overperformers, Torrez and his office seek to chip away at the mental health and child trauma issues that can often put someone on the path to prison.

“With my view, when you’re talking about mental health and addiction issues later in life, what you’re talking about is an unaddressed, untreated and unrecognized childhood trauma experienced sometime between birth and 7 years old,” he said.

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Crime in Albuquerque hits close to home for Sandia/New Mexico. The International District, located just north of the downtown area, has the greatest concentration of crime in the city. With less than 7 percent of the metro area’s population, it has 27 percent of murders, 20 percent of carjackings and 37 percent of nonfatal shootings.

Torr佐 added that 32 percent of those arrested for robbery come from that area, so he wants to expand efforts there, both for law enforcement and community support.

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Torr佐 is the co-chair of Mission: Families, a new program of the United Way of Central New Mexico focused on improving family stability.

“It’s not about going after prosecutors or the mayor’s toy. It’s about making early and sustained investments in the kids of this community. It costs $45,250 per year to house an inmate in prison, Torrez said.

“The community will pay for these kids and these broken families one way or another. The question is, are we willing to go until something horrific happens, and I’m left trying to console a family after someone has been killed, and I must send someone to prison? Or are we going to start thinking differently and making investments in our children’s early traumatic events that reshape people’s lives, such as abuse, violence and discrimination. Torrez said about 75 percent of male and 87 percent of female incarcerated juveniles have experienced five or more such incidents in their lives.

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“实施方案:可知，该系统的一个关键问题是系统之间的信息共享不兼容，这导致了合作问题。

“我们仍然使用WordPerfect，”他告诉震惊的观众。一位Sandia研究员正在与Torrez的合作办公室寻找提高数据分析和可视化的办法。

该办公室刚聘请了一名程序员来帮助解决一些数据共享和分析问题。

总的来说，Torrez的办公室正在寻找方法来关注那些过激分子，并且寻求在早期打击犯罪。

“我的观点，当你谈论心理健康和成瘾问题时，你在谈论的是早年未解决、未治疗和未察觉的童年创伤经历，这种经历发生在出生后7年内。”他说。

Torrez说，犯罪率在大多数较大的城市正在下降，而Albuquerque的犯罪率仍在上升。

Torrez说，一个障碍是调查犯罪和处理犯罪人的系统是基于法院的系统日历——不是一个最有效的方法来对抗犯罪或分配未来的犯罪风险。

“这意味着，危险性最大的人在一个调查人员的案件堆中的位置可以是20位深。目前没有方法可以解决这个问题，”Torrez说。
Young women encouraged to blaze their own trails at Sandia’s Math and Science Awards

Sandia’s Women’s Connection honors exceptional local scholars

By Madeline Burchard

More than 30 students recently visited Sandia National Laboratories in California to attend the 27th annual Sandia Math and Science Awards, a flagship program of the Sandia Women’s Connection.

Every year, the Sandia Women’s Connection receives nominations from local high schools and hosts a ceremony to honor the academic winners for their accomplishments in STEM (science, technology, engineering, and math). During and after the ceremony, students are paired with Sandia mentors, who encourage their future studies and answer questions.

Heidi Ammerlahn, director of the Homeland Security and Defense Systems Center, kicked off the evening by talking about what attracted her to her career.

“My career at Sandia has allowed me to follow my interest in math and computer science while serving my community,” Heidi said. “I encourage you all to consider careers in public service.”

Each year, the Sandia Women’s Connection awards 25 high school girls in the U.S. a $1,000 scholarship and a trip to the Sandia National Laboratories in Albuquerque, New Mexico. In addition, the Sandia Women’s Connection has honored women who are excelling in the field of science and technology. The awards were established in 1992 in honor of Dr. Sally Ride, the first American woman in space.

“Women in my father’s generation believed that women should only be teachers or nurses. That is until they get married and then they stay at home to be a good wife and mother,” Dori said. “That is the idea a Sandia mentor, Tom Lane, that encouraged me to apply for an education program at Sandia. That one-year master’s degree program was life changing for me.”

Dori stressed the importance of seeking mentors and allies.

“Do not hesitate to reach out to us as you make your way,” she said. “We are all rooting for you.”

Plan to change your plans

Carolyn Fisher, a Sandia postdoc in systems biology, gave the keynote remarks. Fresh from finishing her own academic journey, she shared some words of wisdom.

“Please do not be afraid to doubt,” Carolyn said. “When I was in high school, I wanted to be a crime scene detective. Now, I search for algae predators.”

Carolyn reminded us to share this gift. There are still a double-digit number of states in this country that do not offer any legal protections for lesbians or gays.

“The political effect of being forced to live a secret life is real,” Carolyn said. “In the workplace, it is a struggle. It is also emotionally hard to be forced to live a secret life due to the fear of getting fired.”

I have been at Sandia for eight years, and I think of the Labs as my second home. This Pride Month, I want to honor and I feel more at home.

Connections between colleagues that will make all of us feel

I'll end here with an invitation to anyone reading: Help create real ones between lesbian, gay, bisexual, or transgender people in the workplace.

Blazes I’ve seen

I grew up in Texas, which is one of those states with no protections. Two of our best varsity sports coaches were fired from my high school in Dallas while I was a student: one for being a lesbian and the other merely for looking like a lesbian. This was devastating to me as a basketball player because the replacement coaches were nowhere near as good. It was also terrifying to me as a young lesbian. This had a profound effect as I saw firsthand how a career can be impacted. I spent the rest of high school wondering what job I could have as an adult that would be safe for me.

To my dismay but not my surprise, a public school teacher in my hometown was fired just last month for showing her students a photograph of a woman and identifying that woman as her wife. She was not allowed to share a photo of her family, like the one I am sharing here with you. That is my wife, Mary Winston, on the top right, and our two children, Derek and Sara Reitzel.

Fireproofing your home

By Chris LaFleur

I imagine having to wear a fireproof mask all day, every day, in your own home and never being able to take it off — no matter how suffocating it feels. That’s what it’s like for people who risk being fired if they acknowledge their sexual orientation at work.

As a fire protection engineer, I’m naturally aware that suffocation is a physical effect of being trapped in a literal fire. However, suffocation is also the emotional effect of being forced to live a secret life due to the fear of getting fired.

I have been at Sandia for eight years, and I think of the Labs as my second home. This Pride Month, I want to honor Sandia’s commitment to diversity and inclusion and express gratitude for the corporate support of all of our employee resource groups on campus (more on this later).

It is a gift to get to do the work that I love, at a place I love, and be open about the person I love. I also want to acknowledge that there are many people unable to share this gift. There are still a double-digit number of states in this country that do not offer any legal protections for lesbian, gay, bisexual, or transgender people in the workplace.

I want to pursue fire risk analysis from the moment I first learned it was a possible career. I could not believe that fire science was a subject I could actually study in graduate school. I spoke to fire professionals and thought to myself, “This just sounds like the coolest thing ever!”

Once in my master’s program, I began a course that required me to analyze data from fire tests conducted at Sandia. Right away, working at the Labs became my goal. My professor told me Sandia only hired people with Ph.D.s. His comment helped motivate me to continue with school. Once I finished my Ph.D. at the University of Michigan, I applied to Sandia and have never looked back.

Now, I conduct fire risk analysis for hydrogen fuel cell vehicles, hydrogen refueling stations and other emerging energy technologies. It is the job and the opportunity that I had always hoped for.

Keeping risk under control

Mary’s story — and other stories like it — are a big part of why I became a leader in the Sandia Pride Alliance Network employee resource group. Sensitivity training can be helpful, but nothing replaces one-on-one relationships between people. These are exactly what SPAN is designed to foster. The acronym SPAN and our logo are meant to evoke a figurative bridge, while social events and lunchtime discussions help create real ones between lesbian, gay, transgender or bisexualSandia; our allies; and those who’d like to become allies.

I end here with an invitation to anyone reading: Please, come to one of our events. We’d love to have you. A calendar with events both in Albuquerque and in Livermore is on our website. If you’d like to start just by reading about how to be an ally, there are resources on the site for that too.

Join us, and together we’ll make sure we help spark connections between colleagues that will make all of us feel more at home.
Winning the war against waste: Zero Hero success stories

By Lyndsy Ortiz
Illustrations by Michael Vittitow

David Blagg — Conquering Mt. Nitrile

In the battle to keep nitrite gloves from piling up into a mountain, David, a technologist, recognized how many gloves were being used and thrown away. At a trade show, David learned about one of his favorite recycling program and worked with Sam McCord (aka Sandia Sam), the waste management coordinator for the Zero Waste effort, to set up a Sandia account to ship used gloves to be recycled. David picks up the used gloves, boxes them up and communicates his process to his team and building leaders. “I like to be a good steward of the environment,” he said. David encourages others to become Zero Heroes. “People need to be pushed along, and they should send ideas for recycling to the waste management team.” David was recognized for recycling 2,500 pounds of gloves in 2017. To attain victory in the effort to reach the Zero Waste goal by 2025, Read about the heroes who are already making a difference, learn from their inventiveness and environmental consciousness and visit zerowaste.sandia.gov to enlist and start on your path to becoming one of the few — the Zero Heroes.

Justin Griffin — Taking down the Tyvek tyranny

Tackling the tyranny of used Tyvek suits is no easy feat, but another Sandia Zero Hero was equal to the task. Justin, an ES&H technologist, works where Tyvek suits are used and discarded in high volumes. He followed the existing process of collecting them into a bin to be boxed up and recycled by the Pollution Prevention group. Justin, who was already familiar with the Zero Waste goal, took it upon himself to keep this process going when he joined the department. He recyc- led a large bin, which was a driving factor for him to recycle at work. He says, “everybody needs to do their part, both on the homestead and the front lines. Justin had some advice for future Zero Heroes. “Recycling is the right thing to do to keep waste out of landfill. If you see something can be done, do it. Network and brainstorm with others such as the Zero Waste team.” Great advice from a true Zero Hero. Why not heed the call and join the fray?

Copeland Neeley — Battling badges beyond the badge office lines

The tide is turning in the battle of discarded badge holders at Sandusky’s badge office, thanks to Copeland, a personnel security specialist. He remembers learning about the Zero Waste goal by 2025 at his new hire orientation and questioned whether there was a way to recycle the many used badge holders and security plastics thrown away at the badge office. Copeland obtained recycle bins from Sandia Sam for the multitude of col- lected plastics and collect the bins when they are full. Copeland had some advice to other aspiring Zero Heroes: “Look at materials you use and make small changes. Do your part.” Copeland feels the 2025 goal is doable. “It will be very difficult, but achievable. The Zero Waste team knows their stuff, and their passion will spread through Sandia,” he said. Copeland’s words of encouragement come straight from the front lines of the Zero Waste effort.

Joe Martinez — Clearing out the 3D cartridge trenches

No victory is achieved alone in the effort to reach Zero Waste. Chystal and Jeffrey work in logistics to meet Sandia’s shipping needs. They helped Zero Hero Joe Martinez get the upper hand in the 3D car- tridge dumsies by attacking the problem from a dif- ferent angle. Jeffrey noticed that organizations pack- aged used 3D cartridges for recycling on pallets, but individual cartridges carried prepaid labels. To expose the labels, packers were forced to tear the pallet apart and individually package each cartridge for shipment. This process took extra time and resources, and completely voided the organizations’ packaging efforts, Jeffrey proposed that organiza- tions work directly with the recycle company to obtain a single label for the entire pallet instead of 40-plus individual labels. His team lead, Chystal, endorsed the idea, brought it to the attention of the team and brought in Sandia and his team to help them modify the process. The new, single-pallet process lowers time, workload and cost and provides faster customer service. Jeffrey said he feels Sandia is up to the challenge of winning the Zero Waste effort by 2025. “We have to start somewhere, it’s difficult but can be done. People need to buy into the process.” Chystal agreed, saying, “Sandians need to look at things differently and create a culture of change.” Chystal and Jef- fery are shining examples of how united heroes can make a difference. Are you ready to join their ranks?

Diane High and Lisa Teves — Pummeling plastic foam at the Thunderbird Cafeteria

Pummeling the dominating presence of plas- tic foam containers was too much of an under- taking for just one hero. In 2017, High, an interna- tional manager of the Thunderbird Cafeteria for Taheer Inc., and Lisa Teves, a registration specialist who administers the Taheer contract, teamed-up to eliminate plastic foam to containers from the cafe. Diane and Lisa were aware of the Zero Waste goal and the massive amounts of foam material that were going to the landfill. Begin- ning in March, all-to-go containers are recyclable or compostable. The cafe encourages employees to save money and resources by bringing in a cup or water bottle or buying a refillable one from the cafe. Refills are 81. However, moving away from foam is really just an important start. Looking for ways to offer more locally-sourced foods and continually reducing waste and carbon footprint will be an ongoing effort.” Lisa said. Lisa and Diane are excited to contribute to the Zero Waste goal. “We need a lot more people to get involved for success,” Diane said. Lisa added, “If you plan to eat at the Thunder- bird Cafeteria, please use a reusable plate and silverware, and, if taking food to go, please take some time to learn more about using containers provided at the cafeteria and loca- tions throughout the campus for composting and recyclables like plastic and aluminum.”

Terrific team-ups are just one more avenue for the 3D cartridge trenches. Joe Martinez had some advice for future Zero Heroes: “When you see something is wrong, do something about it. Network and brainstorm with others such as the Zero Waste team.” Joe says, “The simple thing is the right thing.”

Chystal Sandoval and Jeffrey Harkins — Uniting for recycling victory

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WANTED
MOSCOW, to play & cheer Dukes of Albuquerque Band, call for more info. Location: 235-4875, ask for Cindy.

LOVING HOME, Maureen Gratt Davis, female. Skilled at spayed, shots current, 3 yrs old, great with kids, lives w/cats, must be only dog. Hodges, 505-677-7491.

How to submit classified ads
DEADLINE: Friday noon before week of publication unless changed by holiday. Submit by one of these methods:
• EMAIL: Michele Fleming (sfleming@sandia.com)
• PHONE: 505-553-5218
• FAX: 505-454-0547
• MAIL: MS 1450 (Dept. 3651)
• INTERNET: From Techweb, search for NextCenter; at the bottom of that page choose to submit an ad under, "Submit an article'. If you have questions, call Michelle at 554-4803. Because of space constraints, ads will be printed on a first-come basis.

Ad rules
1. Limit 18 words, including last name and home phone (if you include a web or email address, it will count as two or three words, depending on length of address).
2. Include organization and full name with the ad submission.
3. Submit advertising. No phone numbers.
4. Type or print ad legibly, use accepted abbreviations.
5. One ad per issue.
6. We will run the same ad no more than twice.
7. No “for rent” ads except for roommates or sublets.
8. No commercial ads.
9. We will not run the same ad more than once a week of publication unless changed by holiday.

Rules
• 4-5 BDR. HOME, 2-1/2 baths, 2-car garage, Mt. San Miguel, 12.3 miles off Paseo Del Norte, SE, 1 1/2 miles from UNM, 1200 sq. ft., accessible to bike, park, schools. $385,000. Lin, 505-369-5312.
• 3-BDR. HOME, 1,899-sq. ft., 2565 1/2, 2-car garage, 30+-mpg, 128K miles, runs excellent, $185,000. Rivas, 505-203-2399.
• 2-BDR. HOME, 1,094 sq. ft., accessible to park, bike path, 4-5 miles from downtown, 505-292-0179.
• 4-5 BDR. HOME, 2-1/2 baths, 2-1/2 car garage, 2,666-sq. ft., 30+-mpg, 128K miles, runs excellent, $185,000. Lin, 505-369-5312.

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NEWSPAPER CLASSIFIED ADS

1. 3-BDR. HOME, 1367 sq. ft., 2-car garage, near UNM, 13-March. 364-1663.
2. 3-BDR. HOME, 1,899-sq. ft., 2565 1/2, 2-car garage, 30+-mpg, 128K miles, runs excellent, $185,000. Rivas, 505-203-2399.
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Last week, Sandia hosted the 12th annual Western National Robot Rodeo, a weeklong, 11-event competition where eight civilian and military bomb squads from around the region solved challenging, simulated scenarios.

"Each scenario is designed to push the teams and the robots to their limits, so they can learn how to work around those limits and gain confidence," said Jake Deuel, Sandia robotics manager and event coordinator. "The bottom line of the Robot Rodeo is we're trying to take good robot operators and turn them into great robot operators."

In one scenario, "The Tube Station" (above), the squads scan the "tube" for radiation. In another, "Red Dawn" (bottom right), the bomb squads worked their robots through the wreckage of a downed "enemy" fighter to find "intel" and other important items. A spotter made sure the robots suffered no harm.

The Albuquerque Police Department won the competition.

— Mollie Rappe