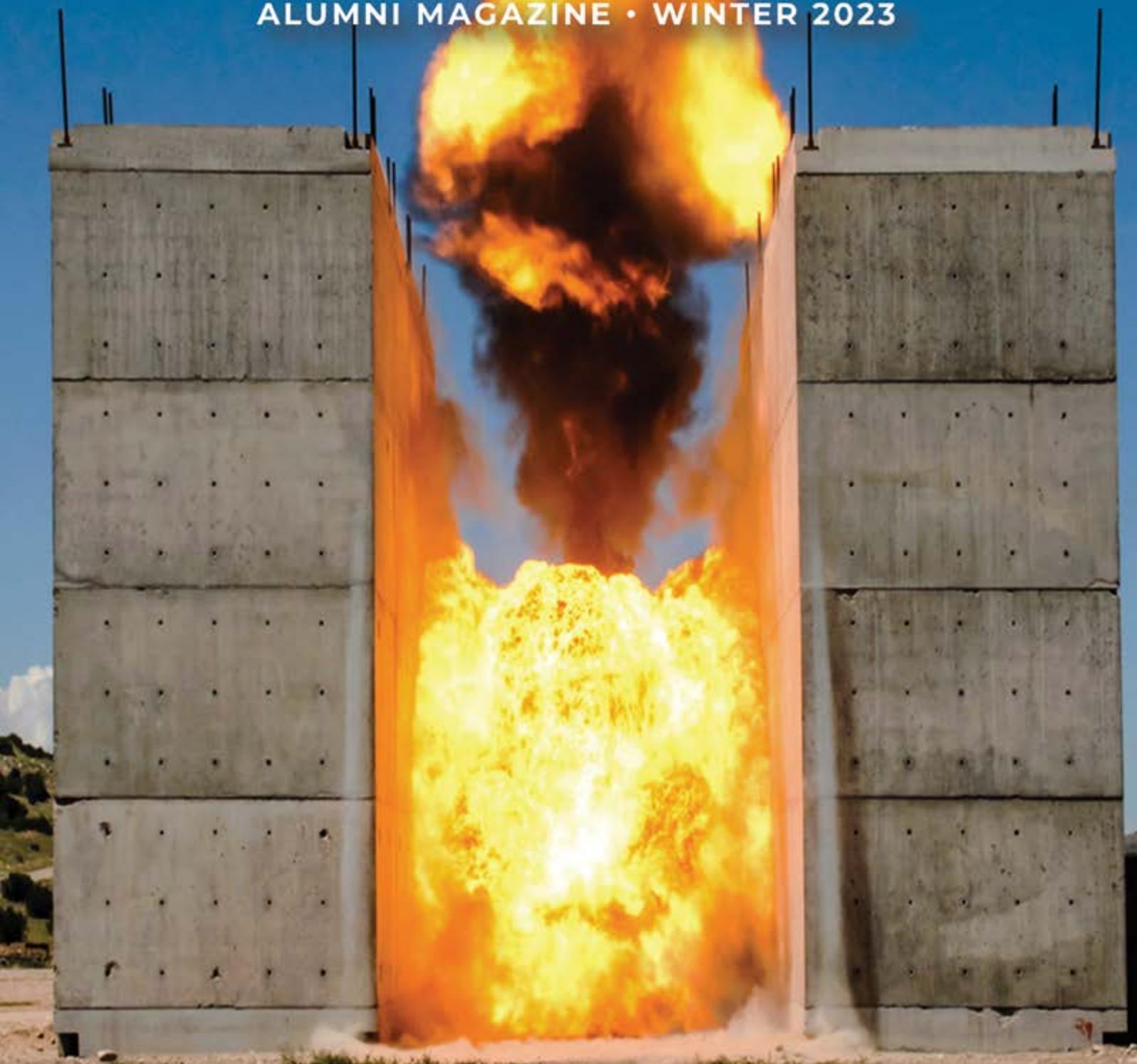


# GOLD PAN

ALUMNI MAGAZINE • WINTER 2023



*Urban Canyon Blast  
at EMRTC*

# IN THIS ISSUE

---

**Editor-in-Chief**  
Colleen Foster

**Design and Layout**  
Stephanie Chavez

**Editor**  
Rebecca Clemens

**Contributing Writer**  
Katie Bauer, *Marketing and Communications*

**Contributors**  
Megan Schwingle  
Damian Banks

**Photography**  
Ashlie Gonzales  
Stephanie Chavez

---

## Administration

Dr. Stephen G. Wells  
*President*

Dr. Olin Cleve McDaniel  
*V.P. for Administration and Finance*

Dr. David Greene  
*V.P. for Office of Student Life & Chief Diversity Officer*

Dr. Michael Doyle  
*V.P for Research*

Dr. Michael Jackson  
*Interim V.P. for Academic Affairs*

---

## Gold Pan Contact

[advancement@nmt.edu](mailto:advancement@nmt.edu)

575-835-5292

**03.** Faculty Spotlight

**04.** New Mexico Tech-Nusenda Agreement

**05.** Events Calendar

**07.** Annual Report

**08.** Student Spotlight: Jonnie Woody

**10.** 49ers Wrap Up

**11.** Alumni Awards

**12.** History of EMRTC

**19.** NMT Sports

**20.** Hantush Deju International Center for Hydrologic Innovation

**21.** 2022 President's Golf Tournament

**22.** People You Know

**27.** In Memoriam

**31.** Undergraduate Research & Innovation

**Advancement & Alumni Relations Office**

Colleen Foster  
*Director*  
575.835.5352  
[colleen.foster@nmt.edu](mailto:colleen.foster@nmt.edu)

Megan Schwingle  
*Associate Director*  
575.835.5353  
[megan.vanwinkle@nmt.edu](mailto:megan.vanwinkle@nmt.edu)

Samantha Vigil  
*Campaign Project Manager*  
[samantha.vigil@nmt.edu](mailto:samantha.vigil@nmt.edu)

Damian Banks  
*Major Gifts Officer*  
575.835.5125  
[damian.banks@nmt.edu](mailto:damian.banks@nmt.edu)

Ashlie Gonzales  
*Administrative Coordinator*  
575.835.5325  
[ashlie.gonzales@nmt.edu](mailto:ashlie.gonzales@nmt.edu)

Stephanie Chavez  
*Multimedia Manager*  
575.835.5236  
[stephanie.chavez@nmt.edu](mailto:stephanie.chavez@nmt.edu)

Sandi Lucero  
*Event Coordinator*  
575.835.5618  
[sandi.lucero@nmt.edu](mailto:sandi.lucero@nmt.edu)

Rebecca Clemens  
*Manager/Database and Technical Editing*  
575.835.5292  
[rebecca.clemens@nmt.edu](mailto:rebecca.clemens@nmt.edu)

*Gold Pan is published twice yearly by New Mexico Institute of Mining and Technology for its alumni, faculty, and friends, by the Office for Advancement and Alumni Relations, 801 Leroy Place, Socorro, NM 87801.*

# NMT Cybersecurity Expert Will Advise FEMA

Story by Katie Bauer

Sharing her expertise to better prepare state and local governments for cyberattacks, New Mexico Tech's Lorie Liebrock recently was named to two key committees at the state and federal level. Liebrock is a Computer Science and Engineering Professor and Director of the New Mexico Cybersecurity Center of Excellence (NMCCoE).

Established by a recent executive order from Gov. Michelle Lujan Grisham ([www.governor.state.nm.us/wp-content/uploads/2022/09/Executive-Order-2022-141.pdf](http://www.governor.state.nm.us/wp-content/uploads/2022/09/Executive-Order-2022-141.pdf)), the Cybersecurity Planning Committee will develop a robust cyber-infrastructure to address risks and threats within state and local governments. The committee also will advise the governor regarding cybersecurity legislation and support applications to receive federal funding to address cybersecurity needs throughout the state.

"New Mexico has had numerous cyber attacks this year against schools, state agencies, health centers, and even non-profits," said Liebrock. "If we don't join forces on cybersecurity, then you will fight the battle alone and you will lose. It is just a matter of time."

According to Liebrock, New Mexico's vulnerabilities remain largely unchecked. "We have to develop a plan for how the state addresses cybersecurity incidents," Liebrock said.

On December 1, 2022 Liebrock began serving a three-year term on the Federal Emergency Management Agency (FEMA) National Advisory Council as its cybersecurity selection



(<https://www.hstoday.us/federal-pages/dhs/fema-welcomes-new-national-advisory-council-members/>). The 40-member council advises the FEMA Administrator on emergency management.

"I'm excited about this because it's, of course, an opportunity to help New Mexico, but it's also an opportunity to help our nation," she said. "Serving in these roles will support CyberReady NM – NMCCoE's collaborative statewide plan to make New Mexico a leader in cybersecurity."

Liebrock joined the New Mexico Tech faculty in 2002 and became a full professor in 2011. She is the founding director of the NMCCoE.

## DONATE TO NEW MEXICO TECH

How can you show your support? Give your time, your energy, or your financial support, and together we can make the future great. Your gift to New Mexico Tech students, programs or research is greatly appreciated.



Scan Code to make your gift online!

# NEW MEXICO TECH-NUSENDA AGREEMENT PROMOTES ENTREPRENEURSHIP

New Mexico Tech and Nusenda Credit Union signed an agreement Sept. 27 bolstering the university's mission to support the development and commercialization of intellectual property developed by faculty, staff, and students. The collaboration builds upon Nusenda's reputation as a longstanding supporter of higher education institutions by providing workspace to the New Mexico Tech Office of Innovation Commercialization adjacent to Nusenda Credit Union, in Socorro.

A celebration of the partnership and agreement signing featured remarks from New Mexico Tech President Stephen Wells and Nusenda President and CEO Joe Christian.

President Wells said Tech's partnership with Nusenda Credit Union is an example of how industry and academia can work together to prompt economic development. Being on California Street, the main street of Socorro, allows New Mexico Tech's Office of Innovation Commercialization to be a robust, visible entity, emphasizing the strong connection between New Mexico Tech and the Socorro community.

"This partnership helps build on the success that NMT inventors have achieved by providing a workspace for them to grow their commercialization efforts," he said. "This agreement and partnership

## Gail Armstrong



## Dr. Stephen Wells



between New Mexico Tech and Nusenda Credit Union is the next step in the effort to promote an entrepreneurial culture on the Tech campus, focusing on commercializing technology created and developed by NMT faculty, staff, and students."

The OIC was created in 2017 to promote an entrepreneurial culture on the NMT campus, focusing on commercializing technology created and developed by NMT. OIC's Executive Director, Dr. Myriah Tomar, leads and manages NMT's intellectual property and oversees the university's economic development initiatives. The OIC intakes new invention disclosures from NMT faculty, staff, and students, and evaluates these disclosures based on their commercial potential.

The Technology Commercialization Accelerator (TCA), a program directed by the NMT OIC through a cooperative agreement with the Small Business Development Center Network, co-occupies the space with NMT startups. Led by Coordinator Estefanita Rawlings, the TCA provides clients across the state intellectual property and cybersecurity training.

# Alumni Receptions February – June, 2023



Alumni reception at National Press Club in Washington DC  
December 10, 2022.

- **March 9, 2023** - Santa Fe, NM reception  
6:30 – 8:30 pm at Ortiz Restaurant, Hilton Santa Fe
- **March - TBA**  
Northern California  
Washington
- **April - TBA**  
Los Alamos, NM  
Oklahoma City, OK  
San Antonio, TX  
Austin, TX  
Massachusetts  
Pennsylvania
- **May - TBA**  
Albuquerque, NM  
Las Cruces, NM  
Seattle, WA  
Silver City, NM  
Illinois  
New York
- **June - TBA**  
Dallas, TX  
Virginia  
Wisconsin



# EVENT CALENDAR

**New Mexico Tech Performing Arts Series**

\$15/ADULT, \$12/SENIOR, \$5/YOUTH • MACEY CENTER • SOCIAL HOURS: 6PM SHOW: 7:30PM •

<b>BIG RICHARD</b> Fri 1.20  <i>Homestyle Comfort Food</i>	<b>CAMERATA DEL SOL</b> Fri 1.27  <i>Free Presidential Chamber Music Series Concert</i>	<b>ANNUAL COMMUNITY ARTS PARTY</b> Sat. 2.4  <i>Free crafts event for all ages! Wear old clothes.</i>	<b>ALBUQUERQUE JAZZ ORCHESTRA</b> Fri 2.10  <i>Sweetheart Soiree Dinner</i>
<b>JASON BISHOP</b> Fri 2.24  <i>Magic, illusion &amp; a puppy named Gizmo</i>	<b>RHYTHM OF THE DANCE</b> Thu 3.2  <i>Taste of Ireland</i>	<b>STRING QUEENS</b> Fri 3.24  <i>Free Presidential Chamber Music Series Concert</i>	<b>WOMENFEST '23</b> Sat 3.25  <i>Free outdoor wellness festival</i>
<b>CANVAS &amp; COCKTAILS</b> Fri 3.31  <i>Fun art event with drink specials &amp; appetizers</i>	<b>STATE ST BALLET JUNGLE BOOK</b> Fri 4.14  <i>Free Story Time Fun</i>	<b>LITTLE SHOP OF HORRORS</b> 4.21-23  <i>Starring NMT &amp; Socorro Community Theater</i>	<b>CINCO DE MAYO TACOS &amp; TEQUILA</b> Fri 5.5  <i>Celebrate with music, games &amp; great food!</i>

**Summer Community Events**

6.5-10 Missoula Children's Theater  
7.4 Fourth of July Celebration

Social Hour & Special Event prices vary  
Visit our website for more information

**SUPPORT THE ARTS AT NEW MEXICO TECH!**

Donations support the arts for Socorro County. They are used for community outreach programs, discounted tickets for students and special populations; AND, to help keep our ticket prices affordable. Ticket income comprises only 20% of the necessary income to pay for PAS performances.

Private individuals who donate to NMTPAS are credited in online and printed show programs according to their donation level and can select a show to sponsor, if desired, for \$500 and above.

INDIVIDUAL DONATIONS			
<small>*May be designated as a Memorial for individual</small>			
Contributor	\$25	Benefactor	\$250
Patron	\$50	Sponsor	\$500
Donor	\$100	Major Sponsor	\$1,000

MEMORIAL ENDOWMENT			
<small>Established to fund arts education &amp; outreach programs</small>			
Platinum	\$50,000+	Copper	\$5,000
Gold	\$25,000	Bronze	\$3,000
Silver	\$10,000	Turquoise	\$1,000

**NMT.EDU/PAS • (575) 835-5688 • PAS@NMT.EDU**

# Fiscal Year 2022

## OFFICE FOR ADVANCEMENT & NEW MEXICO TECH FOUNDATION

**Total donations July 1, 2021 – June 30, 2022**

**\$5,673,227.38**

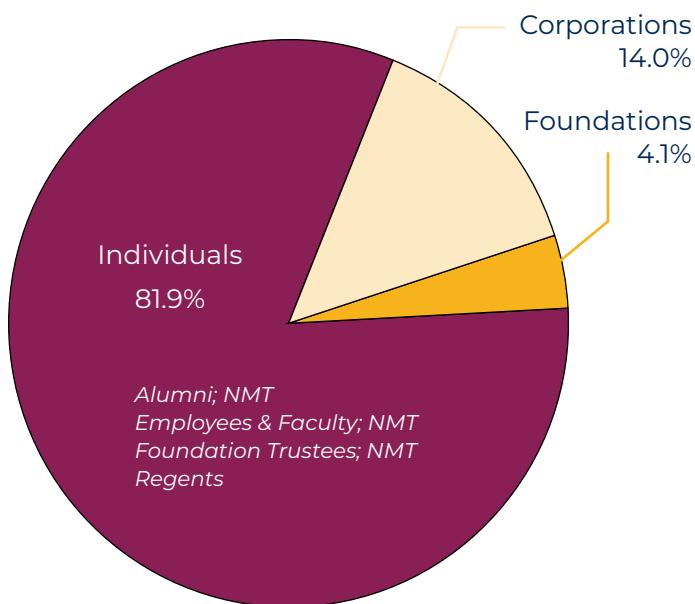
### Financial Aid Awarded

- Institutional Endowment  
\$3,633,751
- Federal, State, and External  
\$2,397,343
- Undergraduate Support
 

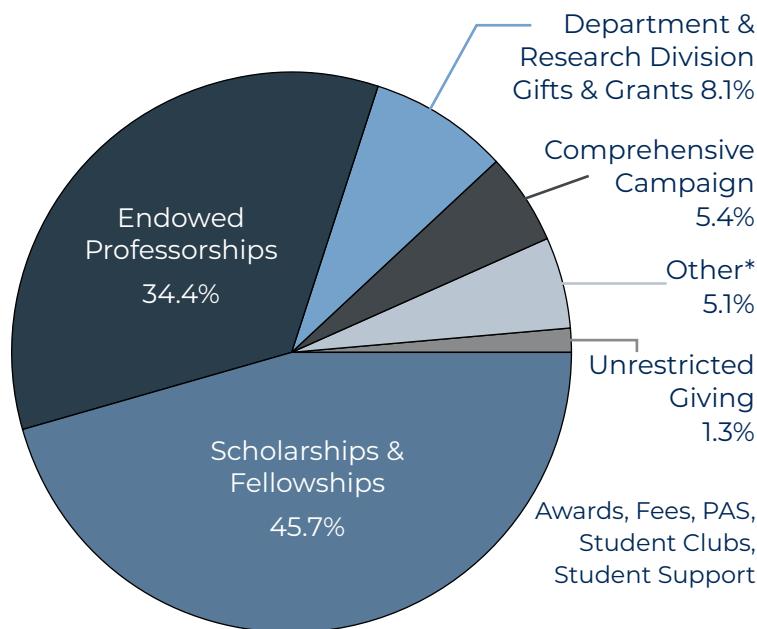
Number of undergraduates	1,124
Number awarded aid	701
	208
- Subset who graduated in AY 2022
 

2022 graduates who borrowed	111
Average amount borrowed	\$22,418

### FY 2022 Donation Sources



### FY 2022 Donation Categories



### NMT Cost (Tuition & Fees)

Fall 2022  
Full-time, per academic year

#### Undergraduate

Resident	\$9,154
Non-resident	\$26,408
<b>Graduate</b>	
Resident	\$9,468
Non-resident	\$27,948

Scholarship funds used for tuition, fees, and course materials (required textbooks, supplies and equipment) are tax-free.

Scholarship funds applied to living expenses (e.g., room and board) are taxable.

## STUDENT SPOTLIGHT

Story by Katie Bauer

# Jonnie Woody

Working in the New Mexico Bureau of Geology and Mineral Resources' Analytical Chemistry Laboratory, Jonnie Woody is learning about more than research, lab techniques, and water quality. While her job involves logging water samples brought in for pH and alkalinity analysis into the lab's information system, she's also sensitive to the concerns of the people behind the samples who use the water for drinking, cooking, cleaning, sanitation, agricultural, recreation, and industrial needs.

Woody, a senior studying biomedical sciences, grew up on the Navajo Nation, cultivating a sacred regard for water.

"I remember my great-grandmother on my dad's side when I was a kid. She didn't have running water or electricity. I remember drinking out of a bucket with a metal ladle that she had hauled from somewhere."

As a participant in New Mexico Tech's Bright Star Scholarship Program, Woody is learning about research methods, instrumentation, and water analysis through her paid internship that is helping her realize her dream of a college degree. Woody also is working toward her goal of attending medical school and becoming a pediatric oncologist. She's due to graduate this spring, then plans on working or doing post-baccalaureate work during a gap year before applying for and attending medical school.

Woody's interest in becoming a doctor stems from her childhood, growing up in Shiprock among an extended family that included close family members who developed cancer, heart disease, diabetes, and other chronic health issues. Her interest in health care also was handed down from her grandmother and mother, who both worked as certified nursing assistants and an older sister who is



**Jonnie Woody, Bureau of Geology and Mineral Resources Geochemist and Chemistry Lab Manager Bonnie Frey, and Environmental Science major Taylor Yazzie pose at the Palm Springs Convention Center, site of the American Indian Science and Engineering Society (AISES) National Conference. A delegation of students from New Mexico Tech attended the national conference in October 2022. Woody serves as the NMT chapter's vice president.**

New Mexico Tech senior Jonnie Woody describes how the Bright Star Scholarship, funded by Dr. Raul and Shari Deju, is helping her learn instrumentation and water analysis through a paid internship at the Analytical Chemistry Lab. Woody spoke at a ceremony at the New Mexico Bureau of Geology and Mineral Resources on September 23, 2022.

hoping to pursue a nursing career. She observed her relatives providing wound care for her beloved grandfather.

"They knew how to take care of his wound. They were dressing it and they were cleaning it. The only reason why it got bad was because he didn't tell anybody he had it. He hid it from us for a while until it was bad."

Observing subsequent care and medical decision-making in her community and knowing many of her relatives were exposed to cancer-causing agents while working in uranium mines also heightened Woody's interest in doing what she could to learn all she could about helping people with chronic health issues.

After graduating from Navajo Prep High School in Farmington, Woody's classes at New Mexico Tech fueled her interest in biology and medicine.

"I was lucky enough to be exposed to a lot of different topics in my bio classes. I got to learn a lot about the different functions of the body."

Woody said she is most interested in what can be done to prevent and detect cancer at its earliest stages and to build on the "caring characteristic" she says she shares with her sisters, mother, and grandmother.

"The cancers that don't really get screened, like lung cancer and stomach cancer, are what's really relevant in my family."

And Woody's specific interest in pediatric oncology stems from something her grandfather always used to say to her.

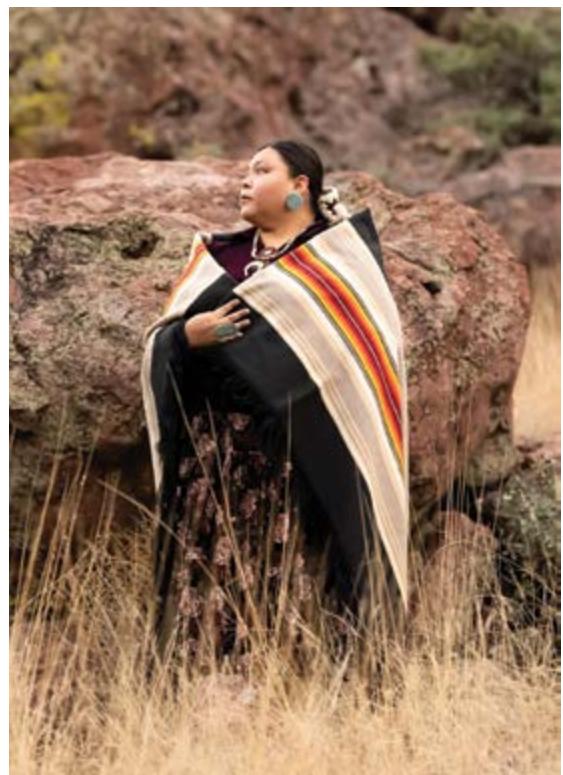
"You don't cry when old people get sick and die. You cry when babies get sick and die, when children or young people get sick.' – that's something that really struck me."

Bonnie Frey, geochemist and Analytical Chemistry Lab manager at the New Mexico Bureau of Geology and Mineral Resources, said Woody's commitment and attitude have made her an asset in the lab.

"She knows firsthand about water issues [on the reservation]. It made sense to learn about analysis of water. It's a good experience for her. Whatever she ends up doing in her life, it can't hurt for her to know how labs work."

Woody said her life experiences growing up in an area where people have concerns about water quality and the impact on health have strengthened her desire to seek out opportunity where she can make an impact.

"I think I regard water in a way that's different than other people. I've learned a lot in this lab. I think I connect with my work now on a more passionate level than before."



## 49ERS WRAP UP

### 49ers Parade

New Mexico Tech Celebrates  
49ers parade on California St.



Advancement's "pizza pie" was crowned champ in the Battle of the Pi(e)s



Cutie Pies for the win!!!



The Rugby Team (champions!) are always  
easily identifiable in their striped jerseys



It's not a 49ers parade without elegant  
horses and riders



Classic cars through the decades



Grand Marshal Paul Cases  
(1942, Mining Engineering)  
riding in style

### PHILANTHROPIST OF THE YEAR

**John Crum** (B.S. Petroleum Engineering, 1975) After a long and illustrious career in the oil and gas industry, he retired as Senior Vice President from Apache Oil. John and his wife Vicki have hosted many Houston-area NMT alumni receptions and recently he brought his leadership skills to NMT where he serves as the Co-Chair for New Mexico Tech's "*Launching Tech to New Heights*" campaign. He is working with NMT to increase industry partnerships and support for the new wing for the Petroleum Recovery Research Center, to which he has personally committed a substantial pledge.



### TECHIE OF THE YEAR

**Scott Williams** (1972 B.S., Basic Sciences; 1984 M.S., Mining Engineering; 1985 Master, Science for Teachers) was a science and math teacher, as well as the gymnastics coach, at Socorro High School for many years. His NMT mining degree led him to a career that took him and his wife Judy all over the world, including Chile, Indonesia, Zimbabwe, Brazil, Suriname and Alaska. They lived for six years in Yellowknife in the Northwest Territory of Canada where he helped develop Canada's first diamond mine. Scott has been a long-time NMT supporter and most recently was the initiator in creating a "Class of 1972" endowment.



### RISING STAR

**Damian Banks** (B.S. 2022, Basic Sciences) As an NMT student Damian created the university's first Esports club and led the team to become competitive in several leagues. Damian served as a student trustee for the NMT Foundation from 2020-2022. He is the founder of Ecliptix Gaming (2013) and is involved in community outreach through Esports. Damian is also a full-time employee now in the NMT Advancement and Alumni Relations office.



### FACULTY-ALUMNI AMBASSADOR

**Navid Mojtabai** (B.S. Mining Engineering, 1982, and M.S. Mining Engineering, 1985) Navid is, and has been for many years, the beloved chair of the Mineral Engineering department. He received his Ph.D. in Mining Engineering from University of Arizona in 1990, and joined New Mexico Tech as a faculty member the same year. Navid stays in very close contact with all of his alumni and they will turn up wherever he might be, leading to a lot of philanthropic gifts and other alumni support for the NMT Mineral Engineering department and its students.



# HISTORY OF EMRTC



**Current EMRTC headquarters**

Innovation, creativity, resiliency, and dedication – all have played a role in the successful 75-year history of the Energetic Materials Research and Testing Center (EMRTC), a self-supporting research division of New Mexico Tech. Located west of the New Mexico Tech campus on a secure 40-square-mile site, EMRTC staff perform research, development, and testing of all types of energetic materials – from improvised explosive devices (IEDs) to military munitions – as well as provide homeland security courses for first responders.

Throughout its history EMRTC has evolved into a multipurpose facility with a safety and security focus. Its staff have responded to national security needs with ingenious solutions, displaying their fierce dedication to keeping our country's soldiers safe – on the battlefield and at home.

EMRTC's customers range from all branches of the military to federal agencies such as the departments of State and Defense, national labs, and private entities including defense contractors such as Honeywell, Lockheed, Raytheon, and Northrop Grumman. Its semi-arid climate allows for year-round use of its many gun ranges, drop testing structures, munitions and explosives testing areas, including the High-Performance Magazine Site for large detonation tests, a 1,000-foot monorail track for dynamic testing of warheads, penetrators, and shape charges, and a Countermine Test Facility, developed to test and

evaluate technologies for detecting and disarming anti-tank mines, anti-personnel mines, and unexploded ordnance. The facility also has unique instrumentation used in testing that's transported around to the various ranges, a machine shop that's used for manufacturing unique materials used in warheads, guns, and projectiles, and labs used to examine explosives and perform ballistics studies and small caliber testing.

Dr. John L. Meason, who served as EMRTC's director from May 2001 to July 2015, said EMRTC has earned a solid reputation among other universities, government agencies, and the private sector.

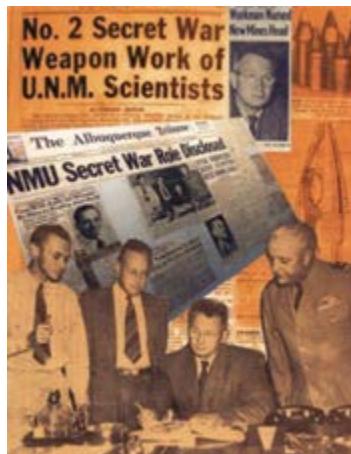
"It is a great place for technology development, research, and New Mexico Tech is a wonderful home for it," he said.

New Mexico Tech President Stephen G. Wells said that EMRTC has had a profound impact on the university throughout its long history.

"As one of our university's first research and training centers, EMRTC and its predecessors stand the nexus in transforming NMT from a mining university to New Mexico's Technology University," he said. "I am very proud of the contributions that EMRTC have made to our nation's security through research, training, and forging the next generation of an advanced workforce in the realm of energetics."

## EARLY YEARS

EMRTC's history really begins with a device known as the proximity fuze, according to Dr. Van Romero (a New Mexico Tech alum, Professor of Physics and former Vice President for Research who now serves as Director of Space Science at Tech). With vast knowledge of how the research areas of New Mexico Tech came to be and developed, Dr. Romero served as EMRTC director for two years from 1995 to 1997, which he describes as "the best professional experience of my life."



During World War II, the Japanese attacked the U.S. fleet in the Pacific, successfully deploying a very simple yet sophisticated attack mechanism: suicide bombers.



**Dr. Van Romero**

"If you're on a ship and an airplane is dropping bombs on you, what you want to do is shoot the airplane out of the sky," Dr. Romero said. "Hitting that little dot from far away is very difficult to do."

If the plane is flying with a constant altitude, the distance between the ship and the airplane can be measured, he said. But suicide bombers, also known as kamakazi pilots, posed a challenge because they didn't fly at a constant altitude, but aimed right at their target, making it too hard to calculate the distance.

A group of researchers at Johns Hopkins University came up with the idea of sending out an electromagnetic signal so that when the artillery shell got near the airplane, it would transmit static feedback, which would then activate its fuze causing the shell to explode, sending out shrapnel that would hit the airplane and take it out of commission.

"You don't have to hit the airplane, you just have to get close to it," Dr. Romero said.

The group at Johns Hopkins had the idea for the proximity fuze, but needed a place to work on it and test it out. That's where Dr. E.J. (Everly John) Workman, a physics professor at the University of New Mexico who was very interested in studying lightning and knew a lot about how electricity propagates through the atmosphere, played a key role. The Johns Hopkins group reached out to Dr. Workman and set up a contract for him to work on the testing of this device, the proximity fuze. In searching for a location for his work, he found an abandoned boarding school on the east side of Albuquerque, the Sandia Girls School, to start

testing the proximity fuze.

Because the contract Dr. Workman had with Johns Hopkins was directly with him and not through the University of New Mexico, the university's president was displeased. Dr. Workman orchestrated a dual regents meeting for the University of New Mexico and the New Mexico School of Mines and even got the governor to attend. Both boards of regents approved moving Dr. Workman's research center from Albuquerque to Socorro, where he could finish his work on the proximity fuze.

The device proved to be wildly successful and was called the second-most important invention of World War II after the atomic bomb. It turned the tide in the Pacific and was also used in the Battle of the Bulge, allowing the Allies to shoot shells over sand dunes where German troops were hiding.

### **TERMINAL EFFECTS RESEARCH AND ANALYSIS (TERA) AND CENTER FOR EXPLOSIVES TECHNOLOGY RESEARCH (CETR)**

What this invention on behalf of the war effort started was a new organization titled TERA – Terminal Effects Research and Analysis – and it started with Dr. Workman, who went on to become president of the university. He later changed the university's name from the New Mexico School of Mines to the New Mexico Institute of Mining and Technology.

After the war, Dr. Workman returned to his lightning research, collaborated with Nobel Prize winner Dr. Irving Langmuir, and started the Langmuir Laboratory for Atmospheric Research in the Magdalena Mountains.

Post World War II, TERA took on a lot of development and testing work for the U.S. military. With the Korean War, then followed by the Vietnam War – all of those major conflicts brought much work to TERA. During the 1950s and 1960s, TERA was part of



# HISTORY OF EMRTC



the development and/or testing of a whole range of weapons systems, including the TOW 2A and TOW 2B missiles, wire-guided missiles, tube-launched and optically-tracked missiles, the Patriot Missile, the Tomahawk, the Hellfire, the Chaparral, side-winder missiles, and more.

"Primarily in the 1950s and 1960s we were testing weapons systems and the whole idea behind these weapons systems is we want to deliver as much energy into the target as we can and minimize the energy that goes into the environment," Dr. Romero said. "The primary reason for that is the more efficient we are at delivering energy into the target, the less explosives we have to put into the warhead. The less explosives we put into the warhead, the lighter it is. The lighter it is, the farther we can shoot it. The farther we can shoot it, the further away our personnel can be from the target. We want our personnel to be as far away as possible."

One of the most important inventions to come out of the Vietnam War era was the Rodded Warhead. When an artillery shell exploded next to an airplane, it produced many pieces of sharp metal but may not have taken an airplane out of the sky. What was developed was a casing that, when it exploded, would eject steel rods that would tumble through the air. This tumbling rod, when it would hit the wing of an airplane, would slice it up or cut through the plane's hydraulics.

"This was early Vietnam," Dr. Romero said. "The Rodded Warhead became a very effective warhead."

Defense production companies would come up with a concept for a warhead, create a prototype, and TERA would test it. If it didn't work as intended, it would be reworked and retested.

"We would fine-tune it and get it so it works," Dr. Romero said.

Testing also involves making high-speed videos of artillery shells flying in the air – at a rate of thousands of feet per second – to determine if they are spinning properly and tracking correctly.

With weapons testing occurring throughout the 1950s, 1960s, 1970s and 1980s, a new organization was formed in the early 1990s called CETR – the Center for Explosives Technology Research.

"The idea was, with TERA doing the testing, CETR would do the research work," Dr. Romero said. "We formed this group that would go to TERA for the testing. They worked together but they were two separate groups."



## ENERGETIC MATERIALS RESEARCH AND TESTING CENTER (EMRTC)

Both TERA and CETR existed with their separate missions until 1993, when the university merged the two groups into one new organization – Energetic Materials Research and Training Center (EMRTC), incorporating both research and testing of explosive materials. In 1995 a new building was built west of New Mexico Tech near M Mountain, which continues to serve as the organization's headquarters today.

## TESTING

While some of the weapons testing work is now done by computer simulation EMRTC continues to do the traditional ballistics and explosives testing for public and private sector clients. EMRTC personnel do a lot of coordination and scheduling of their activities on their testing ranges and follow a very sophisticated safety procedure before they do any testing, to make sure no one is in harm's way.

"We do computer simulation here but our bread and butter is actually working in the field," Dr. Romero said.

While other universities have programs that study explosives, the amount of explosives they can detonate is on the order of grams. EMRTC can detonate up to 50,000 pounds of explosives.

"So there's nothing like it – at a university," Dr. Romero said. "There are military bases that can do what we do but they're only there for military work."



**Mike Stanley**

New Mexico Tech alum Mike Stanley, who retired from EMRTC in January 2022 after 36 years with the organization, five of which he served as director, said that major defense contractors can come to the site to very quietly test a product in development.

"They can develop something, find out what works, what doesn't, and then go take it to one of the federal facilities for official testing," he said.

## COMMERCIAL WORK

One example of commercial work EMRTC has done is testing on vehicle airbags – which Dr. Romero calls "an explosively-driven event."

When a car collides with another vehicle, the impact triggers a switch that lights an "electric match. There's a primary explosive that expands very quickly, creating a lot of gas, and fills up the



40 square miles

# HISTORY OF EMRTC

airbag, which is what protects the driver and front-seat passengers.

EMRTC also was involved in the development of a protective system for police cars involved in high-speed accidents. Some of these accidents would cause the fuel tank to rupture and cause fires. Dr. Romero said EMRTC came up with an explosive device to put the fire out, saving lives and property.

For the oil and gas industry, EMRTC used explosives to punch holes, or perforate, the steel pipes that go down into the ground. With holes in the pipes, the oil can freely flow into the well.

One commercial venture Dr. Romero recalls involved using explosives to tenderize meat. Hundreds of steaks were vacuum-packed and submerged in a huge tank. The underwater explosives detonation tenderized the meat.

Yet another commercial venture involved the creation of diamond powder for saw blades. Making diamonds explosively involves taking an amount of carbon and squeezing it really hard and really fast, Dr. Romero said. The work involved filling a 3-foot culvert with ammonium nitrate and putting the carbon in a pipe inside the culvert. After blowing it up, diamond powder remains, which can be used on the tips of saw blades.

Besides its 40 square miles of testing facilities, EMRTC has 270 locations or buildings on its property, with more than 30 testing sites. The rugged terrain with elevations ranging from 4,000 to 10,500 feet above sea level, unique instrumentation, and testing facilities have been featured in numerous TV shows and movies, including: "Man vs. Cartoon," "National Geographic," "Jeopardy," "Nova" "Guns and Ammo TV," "MythBusters," "12 Strong," "Cry Macho," and "Finch."

Dr. Romero said "MythBusters" worked with EMRTC on 12 different episodes during its 17 seasons. It aired on the Discovery Channel from 2003 to 2016 and on the Science Channel from 2017–2018. Because the partnership proved to be successful and popular, the series was granted special access at EMRTC's facilities and staff assisted the producers in setting up explosions to test various hypotheses.

A memorable episode involved propelling a snowplow 750 feet down a track going 500 miles an hour to see if it could cut a car in half. Dr. Romero

said the series got its viewers interested in science and acted as a commercial for New Mexico Tech.

"Our enrollment went way up during MythBusters," he said.



"Man vs Cartoon" 2009

One of EMRTC's key clients over the years has been the U.S. Department of Justice, specifically the Federal Bureau of Investigation, or FBI. After the first World Trade Center bombing in 1993, in which a truck bomb exploded in a basement-level parking garage under the complex, killing six people and injuring over a thousand, the FBI asked EMRTC to reproduce data from their investigation before the trial of bombing suspect Ramzi Yousef.

"If you go into a court of law – we took this data and this is what we think happened and we got the same results as the crime scene – now the jury's going to believe it," Dr. Romero said. EMRTC's affiliation with New Mexico Tech also lent credibility to the findings.

On the same day that the FBI and EMRTC jointly held a seminar on the New Mexico Tech campus to explain to the scientific community the findings from the World Trade Center bombing investigation, the Oklahoma City bombing took place – April 19, 1995. The seminar had to be shut down since all the FBI staff were being called up to Oklahoma City, leaving the seminar participants to watch the response on TV.



"What struck me was we were watching first responders deal with this huge explosion that had happened at the Alfred P. Murrah Federal Building and I knew that the experts were all in Socorro," Dr. Romero said. "We were watching them and we said 'Wow, we should do something to help those first responders.' So I packed up my bags and went to D.C. and started selling the idea of helping first responders respond to weapons of mass destruction."

Others had the same idea – train first responders so they are familiar with building explosions, car bombs, and suicide bombers. Louisiana State University, Texas A&M, and New Mexico Tech formed a consortium that started up the first responder training program offered at EMRTC, funded with an initial \$3 million award from the Department of Justice in 1998.

Dr. Romero said that EMRTC was already seeking to build the training program further when the terrorist attacks on the World Trade Center towers and the Pentagon took place Sept. 11, 2001.

"I literally got a phone call from the Senate Appropriations Committee in Washington, D.C., asking us how much money could we spend on training first responders," he said. Now that program has a \$22 million annual budget. More than 500,000 first responders from every U.S. state and territory have been trained in Socorro and offsite.

Dr. Romero said that because EMRTC provides that first responder training program, staff get called upon by all sorts of agencies that are doing investigations – both nationally and internationally. EMRTC has worked with a variety of countries around the world, including the United Kingdom, Singapore, Israel, and Australia.

"We help them try to understand how terrorists are attacking, how we can stop terrorist attacks, how we can deal with weapons of mass destruction," he said.

The 9/11 attacks also brought another type of testing in to EMRTC – testing of building materials – including steel and glass windows to see if they can withstand a terrorist bombing or explosion. With different types of glass tested, they can be studied and made more resilient. One site within EMRTC tests walls or facades and different materials to see if coating them with rubber or polymer will make them more resistant during a blast event.

EMRTC's "Urban Canyon" has simulated skyscrapers with floor blocks that can be stacked up to resemble multi-story buildings in big cities such as Chicago or New York City.

"We want to see how the shock wave interacts with these building structures," Dr. Romero said.

Although a lot of work is done by computer simulation, the tests at EMRTC help determine how accurate the computer simulations are – and if they need adjustment.

"It's too expensive to test everything," Dr. Romero said. "But we can test a few unique conditions and put that into the code."



Mythbusters at EMRTC, 2016

# HISTORY OF EMRTC

## EMRTC'S CONTRIBUTIONS

Today EMRTC is a world-class research, development, test, and evaluation facility with 116 highly experienced, specially trained, and technically proficient staff members.

"EMRTC has evolved to meet the needs of private commercial enterprises as well as a full range of government agencies," Dr. Romero said. And because it's located at a university, EMRTC has provided valuable opportunities for students to be involved in research.

Stanley said that while much of the work done at EMRTC is not known by local residents, it has a huge economic impact in Socorro County and the region, infusing more than \$20 million into the state economy and \$2 million into local economy through contracts and purchases of supplies and via the first responders, who spend money on hotels, restaurant meals, and car rentals. EMRTC also sponsors Socorro Fourth of July Celebration fireworks, participates in the annual 49ers Parade, hosts the "Paint the M" challenge, and sponsors other community events.

EMRTC also hires between 30 and 50 students annually, with about \$300,000 a year put into student salaries. New Mexico Tech President Wells said EMRTC has played a huge role in offering exceptional hands-on research opportunities to undergraduate and graduate students.

"The experience that our students gain at EMRTC enhances their competitiveness in acquiring positions in national laboratories as well as shaping them into future leaders in our national defense industries," he said.

Stanley said that a lot of the students who came to Tech were able to get a good start toward their careers by working at EMRTC.

"They get to meet our customers, they get to be involved in all aspects of the testing from doing proposals to doing the design work, collecting data, writing reports – all of that," he said.

Dr. Meason said that providing students with jobs while pursuing their academic degrees has always been one of EMRTC's key functions.

"Students were encouraged to apply knowledge gained in the classroom to research and development programs in progress at EMRTC," he said. Many of the students who worked at EMRTC became employees of EMRTC customers after graduation, he said.

"A lot of the students that came to Tech were able to get a good start by working here," Stanley said. "They get to meet our customers, they get to be involved in all aspects of the testing from doing proposals to doing the design work, collecting data, writing reports – all of that."

Most of the students who work at EMRTC graduate with multiple job offers in hand – including federal agencies, national labs, defense contractors, and other employers, he said.

Dr. Romero said that the people he's worked with over the years at EMRTC are extraordinary and committed to its mission.

"These guys are amazing at getting stuff done," he said. "Because they're saving lives. They're protecting people. They take their job very seriously. They'll get it done no matter what."

Dr. Meason said EMRTC employees have always displayed dedication and expertise in the high-quality work they do day in and day out.

"Every individual has a storied place in making EMRTC the historical giant it is," he said.



## NEW MEXICO TECH ATHLETICS - NOT JUST A RUMOR

Athletics and New Mexico Tech aren't typically used in the same sentence but with 20 sports clubs and 205 active members, maybe that's changing! Clubs include four T-1 (tier 1) teams that are spreading the NMT name and reputation across the country as students compete in Esports, Rugby, Soccer, and Climbing. T-2 (non competing) clubs include Bike Club, Shooting Club, Cricket, Badminton, Tennis, Racquetball, and many others. These clubs give students the opportunity to connect with others outside the classroom or lab, have fun, and stay active.

Last year club members spent an incredible 448 hours volunteering in the Socorro and NMT communities. Volunteer activities included helping students repair their bikes; refurbishing a wooden structure at the gun range; building a new community garden; organizing the annual Festival of the Cranes half marathon; volunteering at 49ers; and outreach to local high school students.

### RUGBY

The Miners have welcomed new head coach Christopher Hathaway from Davenport University to lead them to victory in 2023. Coach Hathaway plans to host a clinic led by Todd Clever, former professional rugby player, and has also submitted a bid to host a qualifier tournament at NMT. Mark your calendars for the 2023 Collegiate Rugby Championships on April 28-30 in Washington, DC!

### CLIMBING

This Spring 2023 semester will feature USA Climbing collegiate competitions, stewardship activities at Box Canyon, outreach events to local youth, and regular indoor and outdoor practices.

### ESPORTS

All five Esports teams qualified for playoffs last year and finished in the quarter- or semi-finals. Most players are returning in 2023 and the club is looking forward to the addition of another team in the new Call of Duty title. There will be multiple competitions in Albuquerque and Las Cruces and the club will continue outreach and mentoring efforts in Socorro and expand to Magdalena middle and high schools.

Everyone in the NMT and Socorro communities is warmly invited to participate in NMT sports as a member of the enthusiastic crowd cheering on the competitors. Want to get involved? Want to support a team? Contact Damian Banks at [damian.banks@nmt.edu](mailto:damian.banks@nmt.edu).



>>> ATTENTION <<<  
**NMT RUGBY FANS!**

The NMT Rugby Team is in need of \$30K to support the team's travel to matches. All donations are appreciated and used for Rugby support.

Go to: [www.nmt.edu/athletics/nmrugby](http://www.nmt.edu/athletics/nmrugby)  


  
New Mexico Tech

# HANTUSH-DEJU NATIONAL CENTER FOR HYDROLOGIC INNOVATION

Story by Katie Bauer

Improving our understanding of water resources and the management of those resources is the aim of a new national hydrologic innovation center at New Mexico Tech. The university launched the Hantush-Deju National Center for Hydrologic Innovation at an afternoon ceremony Friday, Sept. 23, 2022, at the Raul and Shari Deju University House, a new facility on campus that was officially opened at a morning dedication ceremony.



Participating in the ribbon-cutting for the Deju University House on September 23, 2022, are, left to right, Gerald M. Hoehne, capital projects director at the New Mexico Higher Education Department; Dr. Raul Deju; New Mexico Tech President Stephen G. Wells; and New Mexico Lt. Gov. Howie Morales.



Brandon Dennis, a Socorro native and graduate student in computer science, details how the Bright Star Scholarship, funded by Dr. Raul and Shari Deju, has allowed him to now pursue a master's degree after graduating last spring. Dennis spoke at a brief ceremony at the New Mexico Bureau of Geology and Mineral Resources September 23, 2022.



Hydrology graduate student Ethan Williams displays his poster, "Quantifying groundwater to surface water exchanges in the Belen reach of the MRGCD" at the Deju University House September 23, 2022.

Named for alumnus and philanthropist Dr. Raul Deju, and his wife, Shari Deju, the Deju University House is a 5,200-square-foot facility located on the north side of campus that has the capacity to host alumni events, meetings, and training sessions.

The Hantush-Deju National Center for Hydrologic Innovation, which will be located within New Mexico Tech's Research and Development Division, is named after Dr. Raul Deju, a business leader and author who is one of the earliest graduates of the New Mexico Tech hydrology program. Dr. Deju was a student of the program's founder, the late, internationally renowned hydrologist Dr. Mahdi Hantush.

"I am excited about bringing this new center, the Hantush-Deju National Hydrologic Innovation Center, to life and excited that New Mexico Tech will lead the next chapter in the development of water systems with the objective of creating a process for the optimal usage of our Earth's water resources," Dr. Deju said. "Truly, an enormous transformative step for the entire world."

New Mexico Tech President Stephen G. Wells thanked Dr. Deju and his wife, Shari, for their generous support for the university house, the site of the two ceremonies, as well as for the vision and drive behind the hydrology innovation center.

"The hydrology center will be a new organization at Tech charged with conducting research intended to develop innovative tools and answer fundamental questions pertaining to hydrology that are relevant not only to New Mexico, but throughout the world," he said.

Key speakers at the day's ceremonies included New Mexico Lt. Gov. Howie Morales, U.S. Rep. Melanie Stansbury (NM-1), Dr. John Wilson, professor emeritus of hydrology at New Mexico Tech; Dr. Braimah Apambire, senior assistant to the president for global sustainability and director of the Center for International Water and Sustainability at the Desert Research Institute in Reno, Nevada; and Dr. Daniel Stephens, interim director of the Hantush-Deju National Center for Hydrologic Innovation.

## 2022 PRESIDENT'S GOLF TOURNAMENT

The 29th annual New Mexico Tech President's Golf Tournament is more popular than ever! 98 teams played (including several sponsored student club teams), dozens of students from multiple student clubs volunteered their time, and more than \$263,015 was raised during the September 2022 two-day event.

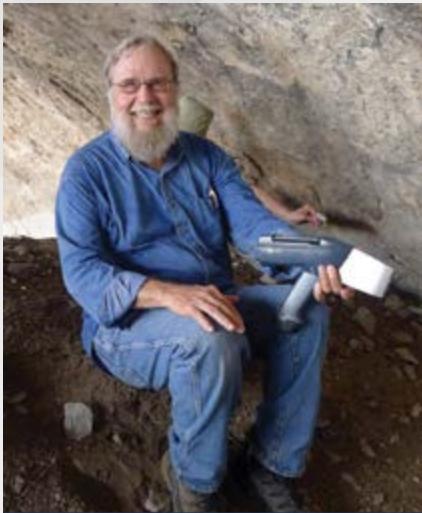
Tournament proceeds go directly to the President's Tuition Assistance fund, which supports NMT students who are nearing the completion of their degrees but have run out of federal and state-sponsored assistance. Since the tournament began in 1994, the fund has supported over 484 students with almost \$991,000 worth of scholarships.



# PEOPLE YOU KNOW

---

## MARVIN ROWE



(B.S. Petroleum Engineering, 1959) is Lab Director of the Low Energy Plasma Radiocarbon Sampling (LEPRS) Laboratory at the New Mexico Office of Archaeological Studies, Santa Fe.

He is a co-author of the following 2022 research paper: Marvin W. Rowe, Marie D. Desrochers & Karen L. Steelman 2022 Lead and zinc pigmented mural paint: Discovering ancient technologies at Lowry Pueblo Great House in southwest Colorado, Kiva: Journal of Southwestern Anthropology and History, DOI: 10.1080/00231940.2022.2103902 <https://doi.org/10.1080/00231940.2022.2103902>.



## DAVID GOODRICH

(M.S. Hydrology, 1978). My wife Margaret and I attended the 49er's homecoming celebration in October 2022 and had a fabulous time. The mineral museum was very impressive as well!

It had been many years since I had last been to New Mexico Tech, and although the school has grown considerably since I attended graduate school there several decades ago, the campus was as attractive as ever. We were excited to see the research and innovations that are now taking place, particularly in the fields of robotic and drone design and application. Our visit brought to mind the coursework and experiences I had as a student there which were invaluable to me in my career and personal life. My appreciation of the school and its values has deepened over the years, as Tech has been and continues to be an institution of exceptional quality and beauty.

Margaret and I have been raving about our visit to everyone and are looking forward to our next visit.

---

## NIRUPAM CHAKRABORTI



(M.S. Metallurgical Engineering, 1979) Professionally, 2022 has been quite eventful for me. I have retired from Indian Institute of Technology and joined Czech Technical University in Prague.

CRC Press published my book Data-driven Evolutionary Modeling in Materials Technology simultaneously from the United States and United Kingdom.

Based on the data in Scopus, Stanford researchers have once again included me among the top 2% materials researchers in the world.

Philosophical Magazine Letters, a very prestigious materials journal published by Taylor and Francis, has appointed me as its Co-Editor. This journal belongs to the family of Philosophical Magazine, established in 1798. It is one of the oldest scientific journals still published, where great scientists like Humphry Davy, Michael Faraday, and James Clerk Maxwell contributed; the discovery of electrons was announced there in articles by Albert A. Michelson, Edward Morley and J.J. Thomson.

### MIKE LORIZ



(B.S. Petroleum Engineering, 1983) I followed the first few days of the Russian invasion of Ukraine with keen interest, having flown F-18 Cs in the Desert Shield portion of the First Gulf War. I was very impressed with both the performance of the Ukrainian defensive effort and the news coverage of the early conflict. When I heard that Ukraine was asking for foreign volunteers, I made plans to volunteer with the blessing of my wife Cara (nee Francke, B.S. Geology, 1986).

I bought my ticket on LOT to Warsaw, Poland, and found a surplus Italian class 4 vest, rated to stop high-power .30 caliber NATO rounds. Each weighs 22 pounds and I was carrying almost 100 pounds of gear.

I crossed the border on foot at Przesmyśl, and soon saw a tent that welcomed foreign fighters. I offered my services and a young soldier escorted me to a bus heading to Lviv. I was taken to the apartment of my host family, "O and V," who were internal refugees from Kyiv. O & V fed me, sheltered me, interpreted for me, and took me wherever I needed to go. After multiple inquiries, I was told I might have a future as a flight instructor or consultant, but I needed to have the US Government confirm my Naval Service record. I returned to Warsaw and the embassy indicated I had to apply back in the US. Before leaving Lviv, I gave O & V my vest to offer to a Ukrainian fighter. They were unbelievably appreciative, and told me that these vests were in very short supply.

Upon returning home, I simultaneously started the State Department procedure and began a drive to buy and send more vests to Ukraine. I ordered the last of the surplus vests, and with generous support of friends and family, sent nearly 80 vests and 25 helmets over to help the effort. By the time my State Department clearance came through, the war had advanced and my aviation skills were no longer in demand.

In total, it was an experience of a lifetime. I continue to hear from O & V and to support the cause. Slava Ukraini!



### MATTHEW MORGAN



(B.S. Geology, 1996) is the new Colorado State Geologist and Director of the Colorado Geological Survey (CGS); he took the reins in September 2022. Morgan has worked for CGS since 1996 in a variety of roles, primarily in the areas of geologic mapping and geologic hazards, and recently served as CGS' Deputy Director and Senior Research Geologist.

"It is an honor to have been selected as the next State Geologist and Director of the Colorado Geological Survey at Colorado School of Mines, and I will work diligently with our dedicated staff and leadership at Mines to move the CGS in exciting directions and connect with the public and our constituencies," Morgan said.

An active promoter of geosciences and STEM activities to Colorado schools and organizations, Morgan has authored or contributed to more than 100 journals, reports, maps and proceedings volumes on topics ranging from geomorphology, minerals, landslides, earthquakes and meteorites. He recently received the GSA/AASG John C. Frye Memorial Award for his work on the CGS publication, "The West Salt Creek Landslide: A Catastrophic Rockslide and Rock/Debris Avalanche in Mesa County, Colorado." He continues to work on many scientific projects and manages the Geologic Mapping Program for Colorado.

Among Morgan's goals as Director is to promote CGS, expand programs and diversify the CGS project portfolio – including groundwater resources and the areas of carbon capture and sequestration, and geothermal energy – and continue to more closely integrate into Colorado School of Mines.

## PEOPLE YOU KNOW

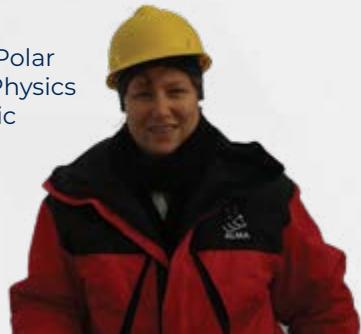
---

### ALISON PECK



(M.S. Physics, 1997; Ph.D. Physics, 1999). I am currently working as a Program Director at the National Science Foundation (NSF), working with astronomical facilities.

I recently finished a six month detail in the NSF Office of Polar Programs, where I was happy to meet other Techies from Physics and Geophysics who are now working with various Antarctic programs. I am back in Astronomy now, and will be working on technology development for new telescopes and instrumentation.



### FRANCIS JUDE MARTINEZ AND ALICIA ALEXANDER MARTINEZ

Francis (B.S. Electrical Engineering, December 2001) and Alicia (B.S. Environmental Engineering, December 2001) are both working at Los Alamos National Laboratory. Francis has earned a Master's in Electrical Engineering from University of New Mexico in May of 2014 and his Ph.D. in Nuclear Engineering from the University of Texas at Austin in December 2021. position: Research Geologist at USGS. Special thanks to the E&ES department for a great graduate education and helping me land my dream job.

---

### GUOHUI WU

Dr. Haoying Wang, Associate Professor of Management, and alum Dr. Guohui Wu (M.S. Mathematics, 2009), have had their article "Modeling discrete choices with large fine-scale spatial data: opportunities and challenges," published in Journal of Geographical Systems, a highly regarded journal in geospatial modeling. Full link to the article: <https://link.springer.com/article/10.1007/s10109-022-00385-7>. Free PDF access link: <https://rdcu.be/cS8IJ>

---

### STEPHANIE JENKS



(B.S. 2010, Physics with Astrophysics Option) has joined Am Law 100 firm Polsinelli as Counsel to the firm's quickly growing Electrical Engineering and Computer Science Patent Prosecution Group. After completing her B.S. at NMT, Jenks earned a Master's from The University of Arizona and a J.D. from University of New Hampshire Franklin Pierce School of Law.

Jenks brings vast experience working with technology companies and a unique approach to her practice, given her diverse background in the areas of physics, astrophysics, and law. She drafts and prosecutes patent applications for clients of all sizes, from Fortune 500 companies to startups.

### KATRINA SOUNDY



(M.S. Geology 2019): I worked with Gary Axen and Jolante Van Wijk on a structural geology thesis that focused on fault microstructures, and learned basic Python coding to support that project. That's been an invaluable skill in my life since!

I began working at Chevron as a Petroleum Geologist in Midland, TX, right out of college. I started in conventional waterflood fields before being exposed to unconventional shale and tight fields. I spent about three years in Midland in my first role, right next door to New Mexico. I made regular drives to my favorite state to get in some fresh desert air!

December 2021, I got my second position at Chevron as an Asset Geologist in the Gulf of Mexico. I moved out to Louisiana, which is where I currently reside. I'm looking at deep water assets here, and doing a lot of interesting work with seismic.

New Mexico Tech gave me all the tools I needed to be successful in my career, and more. I have friends I connected with at NMT that I still keep in contact with today, despite hundreds of miles between us.

This past summer my husband and I hiked up the Mt Rainier volcano near Seattle, WA. We're both geologists by background. We took in the sights, and it was really nice to see some felsic volcanic rocks again! There aren't a lot of rocks to see in Louisiana, and I miss the hikes!

## Do you own a business?

If so, New Mexico Tech students and faculty need your expertise.



- ✓ NM Tech Alumni Entrepreneurs
- ✓ NM Tech Innovation
- ✓ NM Tech Entrepreneurship
- ✓ NM Tech Startups
- ✓ NM Tech Success

If you are an entrepreneur or think you can help an aspiring NMT entrepreneur, please contact [myrriah.tomar@nmt.edu](mailto:myrriah.tomar@nmt.edu)

# TOTAL ECLIPSE



1973 & 1998  
**SAVE THE DATE**  
**OCTOBER 12TH–15TH, 2023**

You are formally invited to attend the gold and silver reunion at 49ers!

**More info to follow**



**MATCHING GIFTS**

**DOUBLE THE IMPACT**

1 you give      2 your employer matches

YOU designate the scholarship, program, or department your gift will benefit.

YOUR EMPLOYER'S matching gift will go to the same fund.

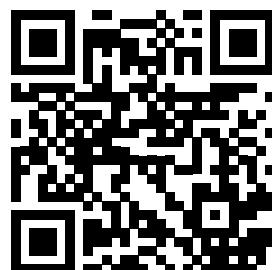
Did you know that your employers may double or even triple your gift to New Mexico Tech?

Many employers sponsor matching gift programs and will match most charitable contributions made by their employees. Some even match gifts made by retirees!

Please contact your HR department to learn if your employer supports matching gifts and let us know! If you have trouble finding out, please contact [advancement@nmt.edu](mailto:advancement@nmt.edu) and we will help you!

Here are some incredible companies that support NMT through matching gifts.

DELL      FREEPORT-MCMORAN      Raytheon      LOCKHEED MARTIN      intel



## Gertrude Ayakwah

(M.S. Mineral Engineering, 2009) passed away on May 7, 2022, the day before Mother's Day, after a very sudden and short illness. She is survived by her husband, Jeffrey Andoh, and two young children, Sophia and Jeffrey, Jr.

Gertrude was born in the Eastern Region of Ghana on November 16, 1979. She grew up in Ghana and completed her bachelor's degree in mining engineering at the University of Mines and Technology in 2005, being one of only six women in her beginning class of about 40 students. After working in the gold mining industry in Ghana for about a year and a half, she was accepted at New Mexico Tech to start her master's degree in Mineral Engineering in 2007.

After graduating from Tech in 2009, she continued her mining engineering career with Sumitomo Metals Mining at the Red Dog Mine in Alaska. In 2015, she moved from Alaska and joined Freeport-McMoRan at the Sierrita Mine in Arizona to continue her career as a mining engineer. She would end up spending more than seven years with Freeport at the Sierrita and Bagdad operations, during which time she married Jeffrey and had her first child, Sophia. In 2019, she joined Rio Tinto at the Bingham Canyon mine as a senior mine engineer and relocated with her family to Salt Lake City, Utah. She had her second child in 2020.

Gertrude loved family and friends, her mining engineering career, and New Mexico Tech. She gladly welcomed friends and colleagues to her home on special occasions and on any ordinary day to talk about life, raising kids and so on. She'd frequently call on friends to see how they were doing. She jumped at every opportunity to attend a Career Fair at Tech and help recruit new graduates or interns for her employers. She spent time at events talking to students and giving them guidance on navigating the job market for success.

Her sudden demise in May 2022 was extremely shocking to everyone. She will be remembered for her dedication to work and the love and warmth of her friendship.



## Daniel Dean Blodgett

(B.S. 1971 and M.S. 1973, Geology) of Coarsegold, CA died on August 27, 2022 at the age of 73 (born January 1, 1949) of multiple myeloma bone marrow cancer. Dan worked a short early career as a geologist, then as a family practice physician until he retired in 2017.

Dan's younger years were spent growing up in various US states and countries as his father was in the Air Force. After high school, Dan attended MIT as a geoscience major, joining Delta Tau Delta house, until he visited the western states and was called to the spirit of New Mexico. He transferred during his senior year at MIT to New Mexico Tech, graduating with a BS and MS in Geology.

While climbing Mt. Rainier in 1974, Dan decided to attend medical school. Onward to medical school in Albuquerque, NM, he graduated in 1983 and spent many years practicing as an emergency medicine and family practice physician in Socorro, NM until moving to Galveston, TX and then to Oakhurst, CA in 2000, then Coarsegold, CA in 2004. In 2013 Dan became a professor for Family Practice residents at the Fresno, CA branch of University of California San Francisco (Parnassus Campus) Medical School. He made many contributions to the communities where he practiced medicine throughout his career.

Dan was a highly spiritual person who cultivated awareness, compassion, and gratitude in living his daily life. He was a devoted husband, father, and grandfather. Dan was also a world-class mountaineer who spent much of his life climbing mountains. Daniel, loved by many, is greatly missed.

Anyone wishing to honor his memory is encouraged to donate to the Commonweal Retreat Center, P.O. Box 316, Bolinas, CA 92924 and to be kind and grateful to one another.

## Richard D. "Igor" Clark

(B.S. 1967 and M.S. 1970, Geology) passed away peacefully at home on November 22, 2021.

Born in Detroit, MI, on November 14, 1943, to Charles Foster Clark and Elsie Beatrice Lealan, Richard grew up in San Rafael, CA. While earning his bachelor's degree at NMT, he met Nancy Page and they were married on January 23, 1968.

In February 1972, Richard and his family moved to Grand Junction, CO where he owned and operated AAMCO Transmissions for 13 years. After that, he continued to work in the automotive industry.

Richard enjoyed Jeeping with firearms in the mountains. He had a passion for serving others, teaching, and living the gospel of Jesus Christ. He served in many callings including a Pathway mission and recently serving at the Bishop's Storehouse.

He is missed by his wife, Nancy and children, Alan (Jen) Clark, Laura (Matt) Zweifel, Susan (Dave) Vickers, and Adam (Kira) Clark.

# IN MEMORIAM



## Keli "Kel" Lewis Etscorn

(B.S. Mathematics and Computer Science, 1993; M.S. Mathematics, 1995) was born in Franklin, KY on September 8, 1967 and passed on January 4, 2023 in Albuquerque, NM.

She graduated from Socorro High School in 1985. After earning her B.S. and M.S. degrees at NMT, she worked for BDM, SonicSEO an AllLaw (computer work) and then had her own businesses: KeliE web design, SEO (search engine optimization), and NMFiber internet service provider.



Her hobbies and passions were her kids, her kids again, music, live music, gardening, photography, technology, cooking, crafts, making people laugh, partying, and helping others.

She was married to Peter Dillon (deceased). She is survived by her parents, Sheri Moore Etscorn and Frank Talbert Etscorn III, daughter Allison Sage Bell, and son Seven Taylor Etscorn. She would be overwhelmed by the love shown by her many, many friends.



## Leanna Cecilia Florez

(B.S. Psychology, 2019) of Bloomfield, NM was taken home to eternally rest on October 29, 2022. Leanna was a beautiful, loving, and humorous daughter, granddaughter, sister, cousin, niece, and friend to many.



She was born May 10, 1998, in Farmington, NM to Carlos M. Florez and Lori A. Chavez. Leanna earned her B.S. in Psychology degree at New Mexico Tech in three years, a fact that she and her family were very proud of her for accomplishing. She started in the Fall of 2016, interested in obtaining a degree in mechanical engineering, but even after switching majors she still did it in 3 years. She found her place of employment at American Equipment Manufacturing as an Engineering Assistant working side by side with all the mechanical engineers, a job which brought her joy, satisfaction, and a feeling of belonging.

Leanna loved to be around her family and friends. She could walk into any room and instantly light it up with her vibrant personality. She was passionate about taking pictures of every moment that was important to her and developed a hobby of professionally capturing photographs. Leanna found peace in listening to music and spending time with her family and friends.

Memorial tributes may be made to BHS Alumni Scholarship in memory of Leanna Florez, Bloomfield High School, 520 N. 1st Street, Bloomfield, NM 87413. BHS wants to help a student who plans to attend New Mexico Tech.

## Charles "Chuck" D. Glazer

(B.S. Mathematics, 1968) of Cuyahoga Falls, Ohio passed away on October 8, 2022. He was born in Dover, OH on October 17, 1946 to the late Emmett and Virginia Glazer.



Chuck served in the US Army during Vietnam, and after graduating from New Mexico Tech received his master's degree from the University of Akron and retired as a consultant with IBM. He was an Eagle Scout, loved traveling, theatre, reading, but most of all his family.

Per his wishes cremation has taken place, his final resting place will be in Santa Fe, NM. The family asks that donations in his memory be made to the American Heart Association (<https://www.heart.org/>).

## Walter Charles "Rusty" Riese

(B.S. Geology, 1973) passed peacefully from this earth on October 6, 2022, at CHI Baylor St. Luke's hospital following a protracted battle with pulmonary fibrosis. A prominent geologist, loving father, and consummate storyteller, he will be missed by countless friends, family, and colleagues.



Rusty was the elder son of Katherine and Walter Riese of Baldwin, New York. He spent his childhood on Long Island with his Navy veteran parents and younger brother Sandy and attended Archbishop Molloy High School. After his graduation in 1969, he departed for the greater Southwest, specifically New Mexico, to study earth sciences.

After receiving his B.S. from New Mexico Tech, he earned his master's and doctoral degrees in geology in 1977 and 1980, respectively, from the University of New Mexico.

Rusty worked as a geologist and geoscience adviser for Gulf Mineral Resources, Anaconda Minerals, ARCO Oil and Gas Company, Vastar Resources, and BP, having successfully navigated a series of acquisitions and mergers. He was known for his work ethic and spirited partnerships with colleagues. He traveled extensively for work, eventually visiting every continent but Antarctica, and residing in Colorado, California, and finally Texas for the rest of his life. He authored dozens of papers and held numerous U.S. and international patents for his work. Even in retirement, he continued to give lectures on economic geology, coalbed methane sequestration, and climate change.

He will spend his eternity becoming one with the Sangre de Cristo mountains in northern New Mexico, where he longed to spend his retirement. Though the world is decidedly darker without him in it, his light shines on in every story you tell of him to another friend or family member.

## John D. Roe, Jr.

(B.S. Petroleum Engineering, 1970) passed away peacefully at home surrounded by family on September 15, 2022.

John was born in Cody, WY on June 30, 1948 to John D. Roe Sr. and Clara Rowena (Reding) Roe; he was the oldest of three brothers. His father worked the oil fields, which prompted many moves until finally landing them in Farmington, NM, which John considered home.

After earning his NMT degree, John worked for Union Oil for many years, which took him to Texas, Wyoming, and Oklahoma before he decided to return to Farmington, NM in 1982 where he worked for Dugan Production until he retired in 2018.

John was passionate about animals and lovingly cared for all of God's creatures. He provided a loving home to many rescue dogs and cats throughout the years as well as caring for a feral cat colony. John also served on the board for the City of Farmington Animal Services Advisory Commission. He was well known for being kind and selfless in all aspects of his life, but especially for his love of animals.

He is survived by his wife of 54 years, Debbie Roe, his daughter Shellee Roe (Stephen Deeb), and other cherished family members.

In lieu of flowers, John would have preferred for donations to be made to either Best Friends Animal Sanctuary in Kanab Utah (<https://bestfriends.org/>) or to the Farmington Regional Animal Shelter (<https://fmtn.org/772/Foundation>) in his honor.

## Shirley A. Thieda

(Master of Science for Teachers, 1972) was born in Chicago, IL, on May 31, 1943 and passed away after a short illness on April 25, 2022.

In addition to her MST from New Mexico Tech, Shirley earned an AA. from Morton College in 1963 and a B.A. in Geology from Southern Illinois University in 1967.

Shirley had a long career as a geologist and teacher: Consulting Geologist and Landman, Albuquerque, NM, 1980 to retirement; Senior Geologist, Cactus Resources, Phoenix, AZ (1984); Geologist, Pioneer Nuclear Incorporated, Albuquerque, NM, (1974-1979); Teacher in Earth Science, Santa Rosa Middle School, NM (1972-1974); Teacher in Earth Science, Ruidoso High School, NM (1968-1971); and Geologist, Illinois Geology Survey (1964).

Membership in professional organizations was an important part of Shirley's life. She served as Treasurer (1984) and President (1986) of the Albuquerque Geological Society; Education Chairman of the Albuquerque Landmen's Association (1982); and she was a member of American Association of Petroleum Landmen and American Association of Petroleum Geologists.

Shirley was married to Wayne Russell Skipworth (deceased); she is survived by two sisters.

# IN MEMORIAM



## Alan Wilder

(B.S. Metallurgical Engineering, 1971) passed away in June 2022 at the age of 74 following a lengthy illness. Al was born in Hobbs, NM and is survived by his wife, Merrilin.

*Contributed by classmate Joe Milbourne:* Following graduation from New Mexico Tech, Al enjoyed a long and illustrious career in mining. He began at Duval Mining in Tucson, AZ as a process metallurgist in 1971. He then went to work for Bechtel Engineering in San Francisco, traveled to South Africa and later worked for Coeur Mining. It was in South Africa where he met Merrilin.

Al was involved throughout his career in the design, construction and operation of many significant mining and processing facilities including: The El Mesquite Gold project (one of the first large-scale heap leach operations), the Coeur Rochester Mine in Nevada (a very large silver heap leach and one of the first installations to use drip irrigation), the El Sauzal Gold Mine in Mexico (one of the first projects utilizing dry stack tailings), the Tintaya Copper mine in Peru, and the Kensington gold mine in Alaska. He was a sought-after consultant following his retirement from Coeur.

*Contributed by classmate Doug McGregor:* I first got to know Al in our junior year at NMT, however in our senior year he offered to share the house he and Reland Kane B.S. Chemistry, 1971) were living in. One of Al's early construction projects was to build a TV lounge by walling off an area near the kitchen, complete with bean bags, pillows, mattresses, etc. Reservations were required. Al's nickname at Tech was Wild Man and he fully lived up to the moniker. Many, many evenings after homework and study, the three of us would wander over to the Capitol Bar and have a couple pitchers of Bud with steamed Hatch green chile dogs. The camaraderie and time together there and elsewhere will always be fondly remembered.

Al had a marvelous sense of humor and was always there to provide help. As a personal example, after graduation Al headed to work for Duval Mining in Tucson, AZ. I was going to graduate school in Ohio, but the military intruded and I was looking for a job. I got a call from Al with a job tip that a mine north of Tucson was expanding and perhaps hiring engineers. I put in my application and ultimately got hired after my military obligations. When I arrived in Tucson to begin work in 1972, Al and his two roommates welcomed me as a fourth. I often think about what my long-term future would have held had it not been for that thoughtful phone call and job tip.

Al's life was one of intelligence, high energy, gregariousness, and an abundance of self-confidence. He was a good man who I was privileged to have known and shared a small part of my life with.

## Faculty

### Dr. Donald "Don" Brandvold



Don Brandvold passed away in December 2022. He was a member of the New Mexico Tech Chemistry Department for 37 years, beginning in 1965, after receiving his Ph.D. from North Dakota State University. His background was in Biochemistry and he taught courses in that field as well as in General Chemistry. He also mentored a large number of graduate and undergraduate students in their research projects.

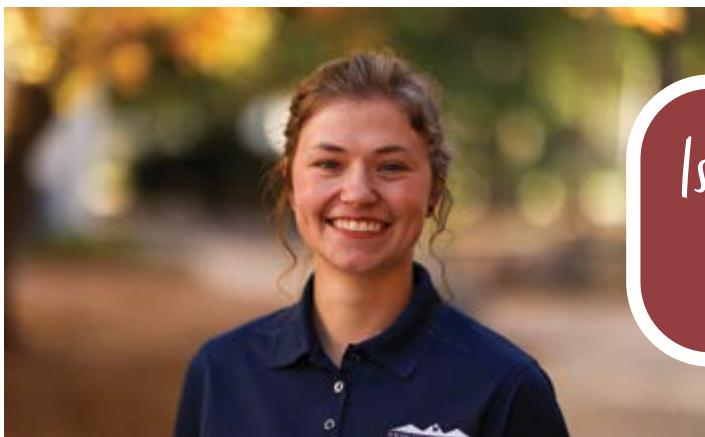
His research interests ranged from water quality studies in the Rio Grande, Elephant Butte Reservoir, and the Gila National Forest to production of oxides of nitrogen from corona discharge in atmospheric lightning and thunderstorms. He was active in the Socorro community coaching young kids in various sports as well as playing on local sports teams in the city leagues.

## UNDERGRADUATE RESEARCH & INNOVATION

Thanks to you, we now have a fund dedicated to supporting undergraduate research at New Mexico Tech.



*Kyle Gallant*  
CLASS OF 2022  
GEOLOGY



*Isabella Wells*  
CLASS OF 2023  
MECHANICAL  
ENGINEERING



*David Padilla*  
CLASS OF 2024  
CIVIL ENGINEERING

**LEARN MORE ABOUT KYLE,  
ISABELLA, AND DAVID HERE**





**New Mexico Institute  
of Mining and Technology**

---

Office for Advancement and Alumni Relations  
801 Leroy Place  
Socorro, NM 87801

---

[www.nmt.edu/advancement/gold\\_pan](http://www.nmt.edu/advancement/gold_pan)

[www.nmt.edu/advancement](http://www.nmt.edu/advancement)

[www.nmt.edu](http://www.nmt.edu)

---

[advancement@nmt.edu](mailto:advancement@nmt.edu)

Non-Profit  
Organization  
U.S. Postage  
**PAID**  
Socorro, NM  
Permit No. 9

