

Mechatronic student Sean Cross competing with a robotic hand. Cross received a perfect score in the ring transfer challenge.



A word from the president . . .



Greetings New Mexico Tech alumni,

As I finish my first year as President of this exceptional university, I can reflect on the exciting and satisfying experiences I have had here in Socorro and across New Mexico. I have found it especially gratifying to work with and get to know NMT alumni – both informally as well as formally with the New Mexico Tech Alumni Association.

As I am sure you know, higher education has faced critical funding challenges in recent years. My staff and I attended a special session of the legislature in order to support continued funding for universities and colleges. This debate was resolved to have a minimal impact on our faculty, staff, and students.

I would like to share with you some of our successes over the past year and my priorities for the coming years at NMT. Most visibly, we have finished construction of the Daniel H. Lopez Chemistry Building and will host a grand opening in September. Other significant projects on the horizon include a new state-of-the-art building that will serve as our new data center and consolidate all the servers on campus. We have also secured funding to renovate Jones Hall over the next two years.

Two new doctorate programs have commenced this year – a trans-disciplinary Ph.D. in Biotechnology and an Energetic Materials Ph.D. in the Mechanical Engineering program.

My key achievements for New Mexico Tech this past year have included:

- Improving institutional communications, including a “President’s Message” to all faculty, staff, and students.
- Redesigning the website. This project is well under way and will be completed near the end of this year.
- Developing campus-wide metrics for the institution so we can better assess our progress.
- Replacing and hiring new faculty, as well as continuing to adjust salaries.
- Promoting positive relations with the city of Socorro and the greater community.
- Encouraging and supporting the entrepreneurial spirit within our faculty and students.
- Developing new revenue sources for our university by building industry partnerships, enhancing research funding, and strengthening private giving.
- Creating a Leadership Council with representation from all key sectors of NMT, ensuring that our Strategic Plan is a living document and establishing a planned growth model for our university.
- Preparing institutional metrics as a benchmark and quantitative assessment tool for long-term improvement and establishing a five-year research plan to facilitate our research endeavors at NMT and expand our research portfolio.

Our university is robust and growing. With our world-class faculty, stellar students, diligent staff, and solid administrative leadership, I foresee a bright and promising future for New Mexico Tech. I encourage you to stay in touch and let me know how you think we can continue to “polish this jewel in the desert.”

Sincerely,

A handwritten signature in black ink, appearing to read "Stephen G. Wells". The signature is fluid and cursive, with a large, sweeping initial "S".

Dr. Stephen G. Wells
President, New Mexico Tech



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inside GOLD PAN

ALUMNI MAGAZINE

TABLE OF CONTENTS

DEPARTMENTS

- 02** FROM the PRESIDENT
- 04** STUDENT RESEARCH SPRI Hand Project
- 09** FACULTY SPOTLIGHT Dr. Ken Minschwaner
- 11** STUDENT SPOTLIGHT Emily Silva
- 14** DEPARTMENT REPORTS
- 22** ALUMNI SPOTLIGHT David Lee Summers and Kumie Wise
- 32** PEOPLE YOU KNOW
- 34** IN MEMORIAM
- 39** THE LAST WORD Tina GÜth

FEATURES

- 08** STUDENT AFFAIRS OFFICE
- 13** CONSTRUCTION UPDATE
- 19** NMSEF
- 20** FROM the PRESIDENT of NMTAA
- 21** ARCHIVE CHALLENGE
- 26** WHERE ARE THEY NOW Tommie McSherry
- 28** GRADUATION 2017
- 30** AWARDS



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New Mexico Tech is an equal opportunity/affirmative action institution.

student research

steinhoff prosthetic
research initiative: the
new mexico tech spri hand
project
<http://infohost.nmt.edu/~mecheng/homepage.html>

A person's life can be irrevocably changed in a moment. Mundane tasks like tying shoes, fastening a necklace, or using a knife during dinner, become extraordinary challenges. Most of us are fortunate and do not have to imagine dealing with such obstacles. But for our friend, colleague, and fellow alum Edie Steinhoff, this scenario became a reality last November when a kitchen DIY project went horribly wrong. In a dreadful accident with a table saw, Edie cut off all of the fingers and the thumb on her left hand. Gina Chavez, long-time friend of Edie and fellow Tech employee, was at home that Sunday morning. She answered a knock on the door, and discovered Edie in shock and bleeding profusely. Stunned, Ms.

Chavez had her daughter drive Edie to the local hospital, while she raced to retrieve the fingers, place them on ice, and rush them to the hospital. Thanks to this quick reaction, Edie's life was saved. But the fate of her hand was uncertain.

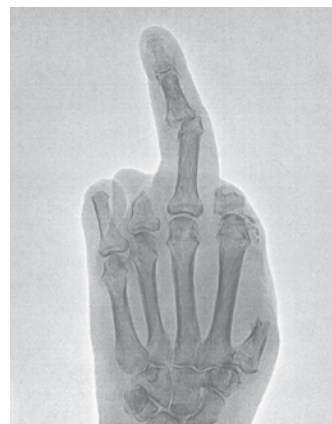
Edie and the severed digits were transferred by ambulance from Socorro to University of New Mexico Hospital (UNMH), where Dr. Deana Mercer, an Associate Professor of Hand Surgery in the Department of Orthopedics and Rehabilitation at UNM, re-attached the middle finger and thumb. The thumb was very damaged by the saw but

the team attempted to salvage it, because it is so important to hand function. The middle finger re-attachment survived, but the thumb was too damaged and did not survive. It had to be removed on November 22, 2016. In the remaining finger, the tendons have now fused to the bone; the finger's joints do not function. The pain from the nerve damage can last for years, Edie said, adding that wearing a compression sleeve does help.

Many people would think that this would be the end of their career. Not Edie, who only missed eight days of work before returning to Brown Hall, where she is a graphic artist and the Marketing and Publications

Coordinator for Tech's Communication Office. Edie has been at Tech for over sixteen years, since she moved to Socorro from South Carolina in October 2000. She has a Bachelor's of Fine Arts, with a concentration in Graphic Design, from Texas Woman's University, and a MBA with a concentration in Marketing. Upon arriving at Tech, Edie said she was so impressed with the quality of Tech students that she joined them, receiving a B.S. in General Studies in 2007, "so I could be one of the smart kids, too." Edie is well known for her work with student organizations; she is an advisor to *Paydirt* and to Alpha Sigma Kappa—Women in Technical Studies. She has won two Student Appreciation awards from the student body. In her neighborhood, she has opened her heart and her home to rescue homeless cats.

New Mexico Tech, being a close-knit and caring community, immediately rallied around Edie. Her many friends and colleagues sent emails of



Left hand, before and after finger re-attachment

encouragement while she was in the hospital, and offered to help in any way that they could once she was home. Friends fed her pets; they folded her laundry – all without ever being asked. Edie said she felt humbled by the outpouring of support from the community. Colleen Foster, Director of Advancement and one of Edie’s close friends, felt driven to find solutions to help her regain some of the abilities that she lost due to the accident. She knew that Edie had friends across the Tech network. Ms. Foster shared the news of Edie’s accident with long-time supporters of New Mexico Tech, who anonymously and generously donated \$53,000 towards research to build Edie a new hand. Ms. Foster also knew that the university had the technical expertise to help Edie.

Enter Dr. David Grow, an Associate Professor of Mechanical Engineering who joined the Tech faculty in 2011 and now directs Tech’s Robotic Interfaces Lab. Dr. Grow came to Tech with his



Dr. David Grow
Ph.D. in Mechanical Engineering from Johns Hopkins University. Four years ago, he worked with teams of students on a Sandia-sponsored project to improve user feedback when wearing a computerized above-knee prosthetic marketed under the name C-Leg by the Germany company Ottobock.

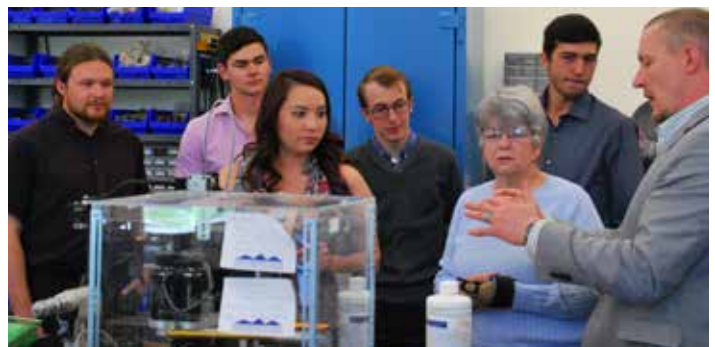
Prosthetic devices have been around for a while in one form or another, and movie watchers are familiar with the type used by Captain Hook in “Peter Pan.” According to Dr. Grow, there is a wide selection of prosthetic devices now available, including special-purpose hands for rock climbing, fishing, office tasks, and

other activities. Much of the current technology benefits from the creation of the “DARPA hand,” the research platform that was the product of the “Revolutionizing Prosthetics” project by the Defense Advanced Research Projects Agency (DARPA). But state-of-the-art prosthetic hands are prohibitively expensive. “There are organizations trying to change that, to make prosthetics more accessible,” Dr. Grow added. For instance, 3-D printing paired with simple cable controls allows for a surprisingly functional device at a low cost.

The Steinhoff Prosthetic Research Initiative, otherwise known as the New Mexico Tech SPRI

Hand Project, seeks to advance the technology of prosthetic hands, and improve the accessibility and availability of these devices. The first priority is developing different versions of the prosthetic hand for Edie, who will be an integral part of the research team as she tests each variation of the device. The second priority is to expand Dr. Grow’s research to help underserved populations, such as women, children, and people living in rural areas. Most prosthetic devices are designed for men because injuries of this nature are typically the result of military and industrial accidents.

Members of the all-volunteer student research team are graduate



SPRI design team (left to right) Benjamin Bean, Andrew Duff, Rebecca Sappington, Ben Sears, Edie Steinhoff, Chris Schmittle and Dr. Grow

student research spri hand project

student Benjamin Bean (software design), Mechanical Engineering seniors Andrew Duff and Ben Sears (mechanical design), and juniors Chris Schmittle (sensor and actuator selection) and Rebecca Sappington (3D printing and “design for manufacturability”). This five-member student design team will work into the summer and fall, Dr. Grow said. “There’s been such an interest, I’ve had to turn down students,” he said, adding that the more money raised, the greater number of students can get involved.

The project to design a prosthetic device, or sleeve, for Edie “hits a sweet spot for us,” Dr. Grow said, adding that much of the robotics research pursued in his lab has clinical relevance. The challenge is designing a prosthetic hand that is lightweight, durable, waterproof, and cost-effective, for starters. Then there are the aesthetic and functional aspects to consider.

Ideally, Edie would be fitted for two devices – an aesthetically designed

hand she could put on in the morning for regular day-to-day interactions (“my Audrey Hepburn hand” as Edie referred to it); the other - more of a work hand, a function-first design that allows fine control for as wide a range of activities of daily living as possible.

Fortuitously, Dr. Grow and Edie’s surgeon, Dr. Mercer, already share a strong research collaboration (Dr. Grow is an adjunct faculty member in Department of Orthopedics at UNM). His collaborators there also include Dr. Christina Salas and her students,

who intend to assist with this project by creating a detailed model of Steinhoff’s hand, allowing a custom-fit for the prosthetic devices.

The design team has been meeting weekly for several months. They have access to a 3D printer that Dr. Grow said has sufficient resolution to make printable parts. “You can design components knowing the limitations of the printer,” he said. In Edie’s case, the focus is on certain parts of her fingers. “There are synergies in how the hand moves,” he said. “In principle, you need to

control 22 movements, but we will only need to control a smaller set of movements,” Dr. Grow said, explaining that the concept involves principle component analysis. The goal is to determine a reasonable number of sensors that could be integrated into an arm sleeve. For Edie, he said, the ideal scenario would be a “cool” prosthetic or sleeve where control of the prosthetic hand would be intuitive.

Advancement Director Foster offered the following: “This is such a unique opportunity for our students to work on



Rebecca Sappington and Andrew Duff demonstrate potential sensors

a research project where they will actually see the difference they'll make in people's lives."

Although Edie admits that her life will never be the same, she envisions SPRI as a mechanism to help others with prosthetic needs. For herself, Edie wants her device to be simple, so that most of the money raised will go to the research.

To donate to the Steinhoff Prosthetic Research Initiative, please go to the New Mexico Tech website homepage (nmt.edu), click on "Be A Donor," and choose "SPRI Prosthetic Hand Project" from the drop-down menu, or contact Lisa Majkowski, Associate Director of Advancement at lisa.majkowski@nmt.edu or 575-835-6168.

Click on the link below to view the KRQE Channel 13 news story featured on April 20, 2017:
<http://krqe.com/2017/04/20/students-working-to-create-special-prosthesis-for-new-mexico-tech-staff-member/>



Attention Classes of 1967 & 1992
Save the Date now and plan to attend your 50th and 25th reunions during 49ers.
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Pass the information on!
Please contact Sandi Lucero at 575-835-5618, or sandi.lucero@nmt.edu with any information or with questions

Searching for alumni for 25th and 50th reunions!

CLASS OF 1967

Judith Evaline Eide
Melvin A. Hogg

CLASS OF 1992

Gina L. Age
Paula Arnet
Kelly Jean Avila
Kristina M. Baker
Susan Fatimah Brown
Bryan Emil Bullard
Robert Carl Buto
Jason M. Coder
Gregory C. Conklin
Kady Crist
Naser Entezari Heravi
William Luis Kincade
Amy Koerner
Ruth C. Lohmann
Charlene J. McBride
Steven Lars Peschke
Janel Lynn Richardson
Garret Kenneth Ross
Cynthia Rose Rybachek
Ann M. Stark
Christopher Paul Wolf

student affairs

multicultural exchange program

VARUN RAO

Indian Student Association

<http://infohost.nmt.edu/~insal/>

“Holi Kab Hai... Kab hai Holi..... “ These famous lines from the Bollywood cult classic movie Sholay, which means “On what date does the festival of Holi celebrated this year?” was on the minds of all Indian students this year at New Mexico Tech.

It has been three years since a significant number of Indian students studied here at Tech and this year, with three families joining in, the Student Affairs Office thought it would be great to celebrate as many Indian festivals on campus as possible, one of the main ones being *HOLI* - the festival of colors. Coincidentally, this year the celebrations were during the Spring Fling festival on Tech campus. The festival signifies the victory of good over evil, the arrival of spring, end of winter, and for many, a festive day to meet others, play and laugh, forget and forgive, and repair broken relationships.



Tech celebrates HOLI - the festival of colors

The Indian Student Association at New Mexico Tech invited all students and faculty to join them in the celebration of Holi,

the festival of colors. The Indian student community prepared delicious Indian delicacies including the traditional drink ‘badam thandai’ which is prepared



Pool tubs filled with water and colors

with a mixture of almonds, fennel seeds, rose petals, cardamom, saffron and milk. Over 200 students showed up for the event. Attendees were greeted by volunteers, who decorated their faces with organic colors. After the warm welcome, the attendees were served food and thandai. As soon as everyone had their food, people started throwing balloons filled with colors on each other. The main highlight of the event were the pools, which were filled with water and colors. People tried to push each other into the pools and had fun. Overall, it was a great event enjoyed by everyone who came to be a part of the celebration. We hope this event is celebrated at Tech every year!

The NMT Indian Student Association would like to thank Tech Administration for giving us the opportunity to celebrate the festival. A special thanks to the International office for helping with this event in terms of organization and financially.

faculty spotlight

dr. ken minschwanner

Physics Professor's Research Targets 'Ugly' Ozone

<http://kestrel.nmt.edu/~krm/>

Dr. Ken Minschwanner's research is soaring – quite literally. The physics professor has overseen several projects over the past 15 years to fly ozone instruments – or sondes – into the atmosphere to study various aspects of this vital greenhouse gas. His

work is helping scientists understand how ozone is transported around the world. Most recently, Minschwanner landed research grants from NASA and the National Oceanic and Atmospheric Administration, or NOAA, to fund the equipment necessary to collect data.

"I just had to support the students," Minschwanner said. "We had undergraduate students helping prepare instruments, launching

balloons, taking data and retrieving the sondes." Those two students made significant contributions to the project by writing MATLAB code to parse the data. Bethany Sutherland started the software project, then left for grad school in Washington. Then Luis Torres updated the code, resulting in a presentation at the AGU conference. He is now in graduate school in Wisconsin.

A previous project in 2008 found surprising results – elevated levels of ozone in thunderstorms over Socorro. The high desert – such as in central New Mexico – typically has low levels of ozone. During that campaign, Minschwanner was flying balloon-borne sondes from the Langmuir Laboratory for Atmospheric Research atop the Magdalena Ridge.

The field campaign – based on campus in Socorro – then detected the signature of low-atmosphere ozone created over the Pacific had been transported via hurricane to the skies over Socorro.



Minschwanner explains the ozone sonde

Minschwanner said the story of ozone is all about "the good, the bad, and the ugly." Ozone in the stratosphere is good ozone, blocking the sun's harmful rays. Ozone at the surface is "the bad" because it's unhealthy for humans and other living things. Ozone in the low atmosphere is "the ugly" because it is a harmful greenhouse gas and has negative climate consequences.

"We are discovering that ozone generated in Asia can be pulled to the upper troposphere, caught in high winds, and transported to the United States," he said. "Then, it comes down as pollution and impacts air quality. That means that no matter what regulations California enacts to regulate



Minschwanner attaches a sonde to a balloon Langmuir lab

emissions at the surface, you might have trouble being in compliance if you're getting ozone from somewhere else."

The same is true with pollution from the Northeast U.S. transported over the Atlantic to Europe.

"The bottom line is that there are no boundaries in the atmosphere," he said. "We all share it. I teach that in my 100 level classes: We depend on atmosphere for everything and it's a thin life-support system."

Currently, Minschwaner and his students have plenty of data to work with, both from his own sonde

flights and from NOAA and NASA data banks.

"I would like to take the software package that we've developed by students and do more work on it," he said. "It's evolved over the years and we have good data sets we can analyze. We can learn about the 'ugly' ozone by coupling our analysis package to existing models of how air gets pushed around ... and find out where it came from. We want to make that software more efficient and flexible for more atmospheric situations." One current graduate student, Zach Lawrence, got a NASA fellowship to work on this project. They already have

six publications with more on the way.

Minschwaner gets excited talking about climate and atmospheric research, but he also has a passion for teaching freshmen and for outreach efforts.

Along with colleague Dr. Sharon Sessions, he teaches the Climate and Sustainability Living Learning Community for freshmen. Sessions teaches the physics of climate in the fall, and Minschwaner teaches a renewable energy lab in the spring.

"I think it makes a good package for freshmen," he said. "Understanding the physics of climate makes

you motivated to work on the energy lab."

In the past he was involved with Tech's Summer Mini-Course program, which was an intensive one-week camp for high school students. He enjoyed seeing teenagers become excited about science and the program served as a good recruitment event for future Techies as well.

Minschwaner and his students have also involved local elementary students in their projects. He's had several classes visit campus during balloon launches, where he and his students can explain the importance of hands-on research projects.



Launching a balloon with Zimmerly Elementary School students from Socorro



Up, up and away!

student spotlight

emily silva

meet emily silva, new mexico
tech's new student regent



Emily Silva

Emily Silva strides into a room. There's something spunky about the New Mexico Tech sophomore. After time in her company, one gets the impression of a young woman straightforward and cheerful, intrepid and intelligent, with a strong work ethic and social empathy.

Such qualities will serve Emily well as the newest member of the New Mexico Tech Board of Regents as its student representative. She was among nine students who applied for and were interviewed for the

position. The top three were then interviewed by a representative of Gov. Susana Martinez, who made the final decision, and the N.M. Senate confirmed her appointment.

Emily seems to have her pulse on issues relevant to today's New Mexico Tech student body, particularly on what students see as a communication disconnect with administration. "I brought that up in the (committee) interview," she said. "I knew there was an issue and it was a huge reason I applied." She also was encouraged by her counterparts in the Student Government Association (SGA), the student body governing unit.

Following in the steps of Silva's predecessor on the Board, Myissa Weiss, Emily vows to be a strong student advocate. She has attended inter-departmental meetings aimed to increase understanding among university constituencies. She cites mental health issues, diversity, and the need for inclusion, as a

focus of student concern.

"Often when students express their views, they are met with a negativity that is not always visible on the surface," she said. "An outlet to speak your mind is a huge deal, and I think President (Stephen) Wells sees that."

On the other hand, Silva recognizes that some changes the students want will not happen overnight. "Students are here for four years, and they expect quick change," she said. "Part of my job is getting them to understand that it may take longer to see results."

One of the questions she was asked by the Governor's representative was whether or not she could make decisions that students might not agree with initially.

"I would hope I could form an objective opinion," she said. Emily hit the ground running when she officially assumed her seat on the Board and credits President Wells' executive assistant, Lala Garcia, as a

tremendous help: "She is a godsend," Silva said.

Silva is majoring in biology with a minor in chemistry under the five-year plan which will culminate in double degrees, both a bachelor's and master's, in 2020. She assists Dr. Siobhan Watkins, an associate professor in the Biology Department, with her research on soil microbiota of the cannabis plant. Her research is on powdery mildew that infects cannabis plants to see if it will affect chile plants similarly, since the chile is the closest cousin of the cannabis plant not regulated by law.

"We run DNA extractions on the cannabis soil," Silva explained. "The goal is to determine whether or not we can culture the powdery mildew and determine if we can find something that safely gets rid of it on the plants so that the chiles (and cannabis) are still of use." The goal is to study which plant strains produce the most potent or effective product, which would aid in growing medical



Emily checking the plants in the Jones Annex lobby

marijuana. The chile plants are grown in the department laboratory. Silva also has more than 80 plants in the home she shares off-campus with her fiancé, mostly succulents, all legal, by the way.

In time, Emily plans to further her research by growing her own chile plants, but currently, she is working on an algal survey from algal biofuel programs at NMSU and Santa Fe Community College.

As a native of Alamogordo, Emily was used to small-town life

and had no trouble settling into Socorro. She was a typical well-rounded high school student, active in the marching band and swim team, all while carrying a high GPA and excelling in mathematics and the sciences. By the time she arrived for her freshman year at Tech, Emily had completed basic math requirements through Calculus II. These days, the calculations she performs are tied to statistics to determine data significance.

Because she was so well prepared for Tech

academically, Emily found herself somewhat bored. "I wasn't involved in anything," she explained. By her second semester, she found a job with *Paydirt*, the student newspaper, as layout editor. "I loved it," said Silva, who in time found herself sleeping at the office. Last semester she worked as a teaching assistant for the Chemistry Department.

"I think that as students continue on you get more and more involved with your coursework, more and more passionate, especially as you get deeper into research – I am constantly in the lab," she said.

New Mexico Tech was the only school she applied to. NMSU was too close to her hometown, and UNM was surrounded by Albuquerque, a city that scares Silva, although she may apply to UNM's School of Medicine after graduation. "My dream would be Johns Hopkins or Stanford," Silva said.

"I've wanted to be a surgeon since I was 14

when I had an internship with a local hospital under a surgeon. Just watching him ... it was the most fascinating thing," she said.

When asked to describe herself in three words, Emily took her time in replying. "Witty, a botanist and a dog-person... I am a total dog person – my mom has seven!" The Silva home was seeped in humor, from her mom's sarcasm to her father's jokes with literary references. "My younger brother is hilarious," she said. "He is the funniest person I know."

A sense of humor will no doubt bolster Emily Silva during her two-year term on the Board of Regents. And, needless to say, she is no longer bored.



Working in the chemistry lab

construction update

chemistry building and more

construction project talking points

The Chemistry Building is now finished, and the department will be moving into the new Daniel H. Lopez Chemistry Building over the summer months.

A grand opening and dedication will be set for the fall semester.



The Daniel H. Lopez Chemistry Building

The first floor of the building will include eight labs, a stock room, graduate student offices, one large classroom, and a vast common area for studying and lounging.

The second floor will include 14 more labs, 14 faculty offices, a conference room, a computer lab, a smaller common area, and a faculty lounge.

The building was funded through a \$15 million General Obligation Bond approved by New Mexico voters during the 2014 general election.

The Chemistry Department doesn't have the largest number of majors; however, much like math and physics, ALL students have to take a regimen of chemistry

classes and laboratories. Every student will benefit from having modern chemistry facilities

The new **Data Center** is out to bid. Construction will begin in June 2017. The new building will be 2,500 square feet and cost around \$2.7 million. Construction will last seven to eight months, finishing in early 2018.



The new NMT Data Center. Ground breaking in June, 2017

This purpose-built server facility will conserve utilities and allow ITC to be more efficient in maintaining computer and internet service to campus

The next priority for capital projects is a new **Recreation Center**, which is still in the very early planning stages.

A committee is still determining how this building will best serve the campus community

The Rec Center will include the basic features of the existing gym, such as basketball courts, indoor track, weight room, rock climbing area and racquetball courts, and add a swimming pool.

The Rec Center could include classrooms, labs, conference rooms, and other meeting areas. Early, very rough estimates are that the building will be 50,000 to 80,000 square

feet and could cost from \$15 million to \$40 million

It is anticipated that facility will help create a "sticky" campus to provide students with activities over weekends and give new faculty incentives to live and stay in Socorro.

NMT administration is looking at partnerships with the City and the School District. The planning phase continues.

Jones Hall

A dated building in dire need of renovation, Jones Hall was funded at \$5 million by the state. This project will cover a new roof, new HVAC system, laboratory upgrades, energy efficient windows, and an energy efficient exterior.

The Chemical Engineering Department will move from MSEC into the second floor of Jones Hall.



Jones Hall

department reports

biology department

<http://infobost.nmt.edu/~biology/biologyfrontpage.html>

Expertise in the Biology Department at NMT covers a range of exciting, cutting-edge, and critical topics. **Dr. Snezna Rogelj**, the department chair, and her team are developing novel drugs which potentiate the classic, clinically-used antibiotics and make them effective again against deadly, drug-resistant bacteria.

Dr. Tom Kieft works with the National Park Service to examine the problematic overgrowth of green bacteria and algae in Carlsbad Caverns National Park, which has arisen in response to the artificial lighting that is essential for visitors to enjoy and learn about the cave.

Dr. Benjamin Duval studies how plants store carbon underground – a crucial aspect of climate change. **Dr. Lyndsay Waldrop** uses biological and mathematical models of tiny, tubular hearts and



Dr. Waldrop shows students

sea squirts to determine how small changes can have a big impact on development. **Dr. Siobhan Watkins** explores the soil microbiome associated with cannabis and is characterizing the viral diversity in the environment. **Dr. Karin Goncz**, the lab manager, oversees all the teaching labs, making sure that students are engaged in hands-on, inquiry-based activities from microbiology to ecology. Finally, the department specialist, **Vanessa Quinones** ensures that the department runs smoothly with a flair for organization and a dash of humor.

chemical engineering

<http://infobost.nmt.edu/~chemel/>

The Chemical Engineering Department carries out research in drug delivery, biofuels, and advanced materials. Professors and students have developed a reductive pyrolysis process to produce low oxygen content biofuels.



Students testing the biodiesel go-cart

Our researchers are creating simulations of new materials like graphene and using them to predict how changes to graphene can be utilized in future applications. We have been using 3-D printing technology to produce “fake” ivory to protect endangered species as well as using 3-D printed ceramics to

act as catalyst supports. Others investigate light active nanomaterials for applications in energy conversion or biosensors.

civil and environmental engineering

<http://infobost.nmt.edu/~envel/>

using fuzzy logic in the evaluation of the seismic preparedness of new mexico essential buildings

The Civil Engineering Department is assisting the New Mexico Department of Homeland Security and Emergency Management (NM-DHSEM) improve the state's preparedness to earthquakes. **Dr. Claudia Wilson** and her students are assessing the seismic performance of essential facilities in eight counties using the Rapid Visual Screening (RVS) method developed by the Federal Emergency Management Agency (FEMA 2002). Former students involved in this task were Alexander Brewster, Richard Benda, Glenn Gavi, Enrique Koerdell, Colton Lake, Jon

Leyba, Kelsey McCaslin, Olufunsho Ogungbade, Amanda Thom, and Elyce Yates.

The NMT team examined buildings in Valencia, Bernalillo, Sandoval, Santa Fe, San Miguel, Los Alamos, Rio Arriba, and Taos counties. These counties were selected by the NM-DHSEM due to the vulnerability of the region to seismic events, the population density, and the high number of unreinforced masonry and adobe buildings present in the area.

The majority of the buildings visited were considered to be potentially seismically

hazardous by the RVS Method, which recommends they be further analyzed by a professional engineer experienced in seismic design and retrofit. This is a costly endeavor, especially considering the large number of structures in the list. Furthermore, the RVS method gives no indication of how susceptible the structures are to seismic hazards, making it difficult for emergency managers to determine which structures should be considered first and appropriately allocate funds.

Former students Jesus Flores and Ivan Perez-Gonzalez developed a

prioritization method to enhance the RVS analysis. This method ranks buildings considered potentially seismically hazardous by the RVS method according to the following criteria: structure's importance to the community, number of structural irregularities, and number and type of failing hazards present.

To facilitate the use of the prioritization method developed and to expedite the analysis of multiple buildings simultaneously, former student Ivan Perez-Gonzalez and current student Elliot Esquivel used fuzzy logic to automate the decision making process. They developed an interface with Microsoft Excel because the fuzzy inference systems were developed in MATLAB, a software not commonly used by emergency managers.

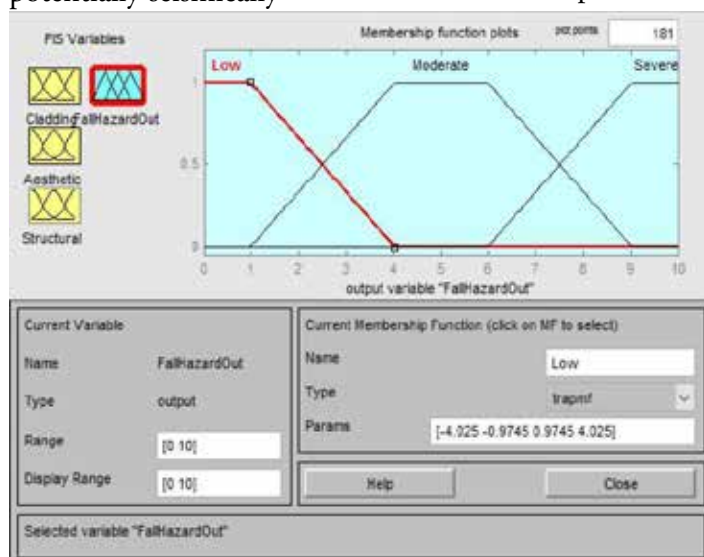
covers a broad range of disciplines, from linguistics and writing instruction to history and the social sciences.

This past year, **Dr. Lara-Martinez**, Professor of Hispanic Studies, published a linguistic analysis of the Nahuat-Pipil language originally spoken by natives in El Salvador and elsewhere. Nahuat-Pipil belongs to the Uto-Nahua family of languages that extends from the state of Utah in the US to Nicaragua.



Dr. Steve Simpson, Associate Professor of Communication, published an edited collection on writing support for Graduate Students through the

University of Michigan Press. His text is titled *Graduate Writing Support:*



Falling Hazard FIS Output Membership Function

communication, liberal arts,
social sciences (class)

<http://infohost.nmt.edu/~bumal/programs/undergraduate.html>

Scholarly work in the CLASS Department

Research, Curriculum, and Program Design.

This summer, **Dr. Alexander Prusin**, Professor of History, will publish *Serbia Under the Swastika: A World War II Occupation* through the University of Illinois Press. Dr. Prusin's book explores how the Nazi's use of terror incited conflict among the various ethnic groups and political factions in the former Yugoslavia.

Dr. Taylor Dotson, Assistant Professor of Social Science, will publish *Technically Together: Reconstructing Community in a Networked World* through MIT Press. His book is an exploration of how current technological practices affect our concepts of community.



workloads on volunteered federated clouds

The proliferation of private clouds that are often underutilized and the tremendous computational potential of these clouds when combined have recently brought forth the idea of volunteer cloud computing (VCC), a computing model where cloud owners contribute underutilized computing and/or storage resources on their clouds to support the execution of applications of other members in the community. This model is particularly suitable to solve big data scientific problems. Scientists in data-intensive scientific fields increasingly recognize that sharing volunteered resources from several clouds is a cost-effective alternative to solve many complex, data- and/or compute-intensive science problems.



Dr. Hamdy Soliman

Despite the promise of the idea of VCC, it still remains at the vision stage at best. Challenges include the heterogeneity and autonomy of member clouds, access control and security, complex inter-cloud virtual machine scheduling, etc.

Dr. **Hamdy Soliman** presents *CloudFinder*, a system that supports the efficient execution of big data workloads on volunteered federated clouds (VFCs).

Evaluation of the system indicates that VFCs are a promising cost-effective approach to enable big data science.

Read the entire paper at <http://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=7926341e>

department of chemistry

<http://infohost.nmt.edu/~chem/>

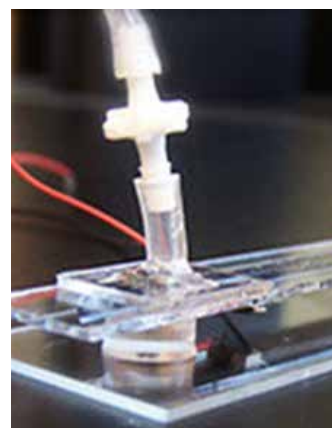
bio-analytical chemistry research group

Sound waves are utilized in several medical and clinical applications. **Dr. Menake Piyasena** and his students are using their expertise in ultra-sound medical

imaging, ultrasonography. Sound waves are also employed in non-invasive removal of diseased tissues, dental care, and cleaning of medical and dental equipment.

Research has shown that sound waves can be implemented to create fast and gentle cell manipulation techniques using fluid flow channels of micrometer scale, known as microfluidic channels. There are certain disease conditions like cancer, diabetes, malaria, and sepsis that alter the biophysical properties of cells.

Sound waves can be utilized in microfluidic channels to identify these altered cells. The



Microfabricated microfluidic detection systems for bio-analysis

computer science and engineering

<https://www.cs.nmt.edu/>

abstract:

cloudfinder: a system for processing big data



Fluorescence imaging for microfluidic detection systems

bioanalytical chemistry research group led by Dr. Piyasena explores ways to develop new diagnostic tools using sound waves and microfluidic channels. The group is currently developing simple methods to separate virus type particles from cells. They use common microfabrication and micromachining techniques to build these devices.

earth and environmental science

<http://www.ees.nmt.edu/>

A karst landscape includes caves, springs, and sinkholes that arise from the dissolution of soluble rocks. Karst aquifers provide water for up to a quarter of the world's population. While conduits control most of the flow and transport

through karst aquifers, their physical locations are typical poorly known.

Andrew Lubmann (Assistant Professor of Hydrology) and **Susan Bilek** (Professor of Geophysics) are using seismic signals and other geophysical responses generated from the



Earth & Environmental Science's artificial recharge experiment

conduits themselves during recharge events to help delineate preferential flow paths and characterize flow through the aquifer.

A team conducted artificial recharge experiments in 2016 (see photo) and also monitored responses during a natural recharge event. All recharge events generated large amplitude seismic signals, and ongoing research is identifying information that may be determined from the geophysical signatures derived from the subsurface.

petroleum department

<http://infohost.nmt.edu/~petrol>

research focuses on stimulation optimization, design and analysis

Well-stimulation is a critical component to the success of horizontal well development in unconventional reservoirs. As a result, a significant need in research exists to improve design and optimize performance.

The department has responded with a variety of current and proposed projects on well stimulation. Experimental research includes assessing transport in slick-water fracturing, optimizing the reuse of flowback fluid for slick-water fracturing, and investigating the potential for formation damage during disposal of fracture flowback water. For the latter, results showed the most detrimental factor is the presence of oil droplets that severely impact the injectivity.

One project looks at the disposal of fracture flowback water. Core samples from the Delaware





formation in southeast New Mexico were used to inject flowback water. Research then compared the quality of flowback water to synthetic formation brine. The program is also applying state-of-the art modeling techniques to improve our understanding of fracture fluid flow behavior. One project uses Comsol software to simulate ball-sealer efficiency for diversion in vertical and horizontal wells. Parameters influencing sealing efficiency such as properties of the ball-sealer, pump rate, and phasing of perforations

will be varied and performance curves developed.

A second project is investigating proppant, which is a solid material (typically sand or manmade ceramic) that is designed to keep an induced hydraulic fracture open. This research studies the placement and quantity of proppant flowing into natural fractures. Few models have been presented for proppant distribution between hydraulic and natural fractures. In this work, a CFD model will be used

to evaluate the statistical proppant distribution in a complex fracture system. Important parameters to be considered are the angle of intersection between

fractures, proppant injection rate, proppant size, and size of hydraulic and natural fractures.

DR. BRUCE HARRISON to GUIDE

the
ALUMNI TRIP
to
New Zealand

Leaving after the
MAY 2018
Commencement

**Ten days in
New Zealand:**
**FOCUS on GEOLOGY
and WINE**

Tentative Itinerary

Day 1&2: Christchurch: Visit to Amberley wine growing region

Day 3: Travel to Hokitika, the center for jade jewelry

Day 4&5: Franz Joseph. Glaciers and Bird watching at Okarito Lagoon

Day 6: Wanaka-and a magnificent lake of the same name.

Day 7: Vineyards in one of the southernmost wine growing regions

Day 8: Travel to Mt Cook

Day 9: Hiking, helicopter rides over glaciers

Day 10: Return to Christchurch

Costs: Travel & lodging approximately \$NZ 200/day. Less for couples Actual cost depends on US/NZ exchange rate, currently 1 \$NZ = 0.693 \$US.

Total number: 15

Mt. Cook, New Zealand

new mexico science & engineering fair

<http://infohost.nmt.edu/~science/fair/>

Many Tech alumni have participated in the New Mexico Science and Engineering Fair (NMSEF) – as student exhibitors, as club members who volunteered to help run the event, or as judges. New Mexico Tech has shared a long history with NMSEF and began hosting this annual event in 1952, only three years after the very first National Science & Engineering Fair.

NMSEF recognizes and rewards excellence in science, mathematics, and engineering projects by New Mexico students in grades six through twelve. Students begin by competing in their local science and engineering fair; those who qualify compete at the regional level. NMSEF then hosts the top 300 student exhibitors from the six regional science and engineering fairs in the state. NMSEF's Grand Award Winners (grades nine through twelve) then have the opportunity to compete in the Intel International Science and Engineering

Fair (ISEF) held each year in Los Angeles, Pittsburgh, or Phoenix. Six New Mexico students competed in ISEF this May in Los Angeles, CA.

New Mexico Tech welcomed Troylyn Zimmerly as the new Director of NMSEF in July 2016. Ms. Zimmerly received her degrees from Tech: BS Biology, 2002, MS Biology, 2005. She said that participation in science and engineering fairs in New Mexico encourages inquisitive students to explore their environment in a systematic and logical manner. It stimulates the students' interest in science and technology while simultaneously promoting the development of the life skills of communication, decision-making, evaluation of alternative solutions, and critical thinking.

Recognition of students for their contributions of knowledge and hard work in science fair contributes to the enthusiasm and excitement that develops as students become involved

in their projects.

She adds that there are many logistics involved in running the annual NMSEF; it has a lot of moving parts – recruiting judges and volunteers, setting up the space, providing a welcoming environment for the student exhibitors and their families, taking the grand award winners to the ISEF, and fundraising, which supports travel to ISEF and student exhibitor awards. There are organizations, non-profits, and individuals who sponsor special awards – certificates, medals, and cash prizes.

The success of NMSEF is dependent on a strong relationship with New Mexico Tech. With Tech's passion for science

and engineering, it is the perfect location for NMSEF. Student exhibitors have the opportunity to interact with top professionals in their field. Many Tech faculty, professionals, graduate students, and alumni serve as judges. In addition to the Tech community, professionals from throughout New Mexico serve as judges. Tech clubs and individual students also volunteer their time to help host a successful NMSEF.

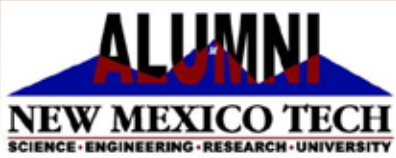
Directing NMSEF is clearly a big job. Ms. Zimmerly said that "Being able to see how science, engineering, and technology can excite these kids, and how they are budding into scientists and engineers themselves" is ample reward.



International competitors from New Mexico. L to R: Sunny Nez (Navajo Prep), AnaMarie Perez (Albuquerque Academy), Sophia Li (Los Alamos High), Lillian Petersen (Los Alamos High), Rj Romero (Rio Rancho High), and Fernando Guerrero (Rio Rancho High)

alumni association news

a letter from your alumni association



Alumni and Friends of New Mexico Tech:

On behalf of the New Mexico Tech Alumni Association (NMTAA), congratulations to the graduating class of 2017!

A common thread found among Tech alumni from any graduating year is that Techies have a discipline and determination that, combined with a Tech education, makes them able to do anything they seek to accomplish. Techies are among the leaders, and higher wage earners, in their industries. Whether continuing with your education or following career, NMTAA wishes you well. The association welcomes keeping in touch to hear about your experiences and to help wherever possible.

The NMTAA alumni awards, presented at New Mexico Tech Commencement ceremonies, recognize the achievements and contributions of fellow alumni and those who support the alumni association and New Mexico Tech. A hallmark of the recipients is excellence in many forms.

Honors for this year's Distinguished Achievement Award recipient go to Lauren Roberts (B.S., Mining Engineering, 1988, New Mexico Tech). Roberts, a licensed Professional Engineer (mining) in several states, is an accomplished leader in developing new and improving existing mining operations in countries throughout the world. Roberts is currently the Chief Operating Officer (COO) for Kinross Gold Corp, a senior gold mining company with mines and projects in six countries.

Honors for this year's NMTAA Distinguished Service Award go to the late Frank Greiner, M.D., (B.S., chemistry and mathematics, 1975, New Mexico Tech). Dr. Greiner had a long career as a professor of radiology at the University Of South Alabama College Of Medicine. Dr. Greiner was proud of his degrees from Tech and credited his New Mexico Tech experience with preparing him for his subsequent

degrees and his career, ultimately allowing him to stand toe-to-toe with colleagues who had attended Ivy League universities. Upon Dr. Greiner's passing in 2015, his family and friends created the Frank Greiner Memorial Scholarship at New Mexico Tech.

Also, NMTAA is pleased to announce that honors for the NMTAA Distinguished Service Award go to The Vigilantes band. The Vigilantes was formed in 1975 by seven New Mexico Tech students, and reformed every year for the New Mexico Tech 49ers homecoming celebration. The Vigilantes observed its 40th, and final, anniversary at the 2016 49ers celebration. For generations of Techies, The Vigilantes concluded each day of events during 49ers with one of the most popular parties of the year, playing Thursday through Saturday nights at the Capitol Bar.

With this time of year symbolizing accomplishments and new endeavors, NMTAA announces the new alumni website at www.nmtaa.org. The website is a central source to learn about association events and happenings, communicate with NMTAA, and manage your membership. And, of course, you can contact us at alumni@nmtaa.org, too.

Another new effort for NMTAA is the expansion of member benefits. The association is finalizing a discount program for paid NMTAA memberships that offers significant savings on rental cars and hotel reservations. Be sure to visit the NMTAA website and Facebook (search for New Mexico Tech Alumni Association) for updates.

Congratulations to our newest degreed alumni and best wishes in your future plans. Keep in touch and let us know about your efforts.

Sincerely,

A handwritten signature in blue ink that reads "K Silsbee". The signature is written in a cursive, flowing style.

Kenneth Silsbee, M.S.

*President, New Mexico Tech Alumni Association
(Class '89, B.S., Technical Communication,
New Mexico Institute of Mining and Technology)*

archive challenge



WHO?



WHAT? WHERE?

Taken directly from the annals of our own *Porphyry* comes the NMTAA Archive Challenge! Send your answers to contact@nmtaa.org. If yours is the first correct answer received, you get to walk away with a lovely parting gift!

49ers 2017
Masquerade
October 19-22

SAVE THE DATE

NEW MEXICO TECH
SCIENCE • ENGINEERING • RESEARCH UNIVERSITY

NMT Career & Graduate School Fairs

- Recruit students
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- Host a workshop

Fall 2017
September 19th

Spring 2018
January 30th

NEW MEXICO INSTITUTE OF MINING and TECHNOLOGY
Established 1889

tristine.hayward@nmt.edu 575.835.5022 www.nmt.edu/career-services

alumni spotlight

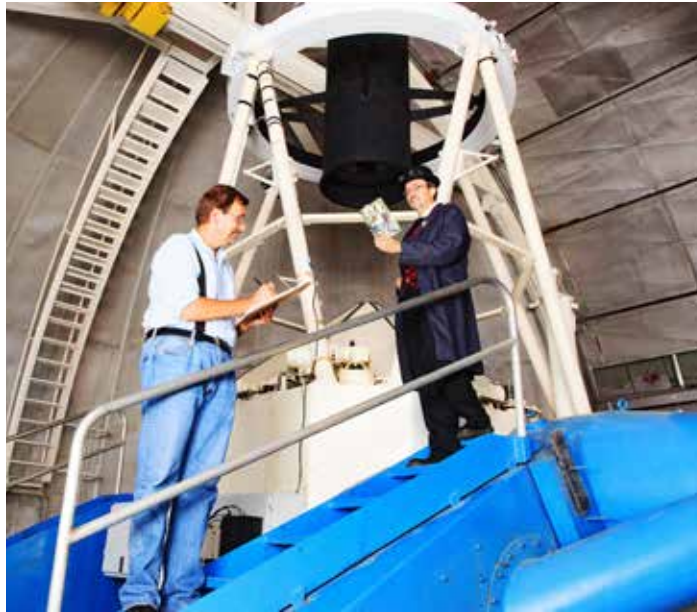
David Lee Summers and Kumie Wise

catching up with a 'couple'
of techies: David Lee
Summers and Kumie Wise

LAS CRUCES – On a modest street in this southern New Mexico city, past a cemetery where the famous lawman Pat Garrett is buried, sits a home quite deceptive in appearance. Unbeknownst to the casual passerby, this abode is actually a castle – it has to be, because every castle has a dungeon, and every dungeon worth its salt has its resident vampire; in this case, Count Dracula himself.

Well, all right, the dungeon is actually a two-stair descent into a room used as an office and museum of sorts; and Dracula, although pretty good-sized, was built decades ago by its creator using a plastic model kit. In another room are tools that render financial data – tricks of the trade familiar to bookkeepers and accountants.

Meet David Lee Summers and Kumie Wise, New



David Lee Summers—Steampunk

Mexico Tech alumni and couple extraordinaire.

Kumie Wise: Michigan native, arrived at New Mexico Tech in 1982 as a physics major, and in 1987 graduated with a bachelor's in mathematics with an emphasis on physics. She received an M.B.A. at the University of Arizona in 1994. Wise initially considered Michigan Tech, but noted that out-of-state tuition at NMT was less expensive than in-state tuition at the college in the Upper Peninsula of Michigan. She admits that the opportunity to “put a little distance” between

herself and her Michigan roots might have played a factor in her choice – but climate and culture never did. She grew up on a farm between two small towns – Lansing was the largest nearby city. “Small town, no biggie,” she said of the move to Socorro.

“I was always a technical person,” Wise added. As a high school senior, she received bundles of recruiting flyers and pamphlets – the one from Tech caught her eye. “I visited, was comfortable, and that was it.”

David Lee Summers:

A native of Southern California, not a surfer, but a desert rat, having grown up on the edge of the Mojave Desert. He arrived at NMT in 1984, graduating with a bachelor's in physics with an astrophysics option. He did graduate work, including research under Stirling Colgate, for two years before transferring to UNM. While there, he was hired by the National Optical Astronomy Observatory (NOAO), and he and Kumie moved to Tucson in 1992.

Summers grew up close to Los Angeles. He soon learned that as a Techie, “You make your own entertainment.” When asked what his particular form of entertainment was, he laughed. Friends, he said, would play Frisbee golf on Friday nights, and maybe get together on Saturday nights to watch Star Trek. He recalls the “battle of the dorms, who-can-play-their-music-loudest” competitions between Baca and South halls.

They recall the Tech

community of their youth as a small and caring enclave where people were willing to help each other. The duck pond was a favorite hangout. A typical day for Summers would be class, study, MTV, then back to study. Kumie, for her part, spent her down time doing crafts and hanging out with friends.

Both are avid readers, prompting Summers to say that when he and Kumie were first engaged, there were those who teased him for popping the question in order to share her book collection. Their first actual meeting, if it can be called such, was as classmates in a physics class taught by Ross Lomanitz. But it was as part of a folk-dancing group that Kumie and Dave started dating. She was already a part of the group – he joined in for an evening at the invitation of friends Eileen Comstock and Warren Marts (also NMT alumni).

The couple also was part of the Mike Iatauro-directed musical, “Brigadoon” – she in a back-stage role, he

reciting five lines as Angus. They married on May 19, 1990, at the home of Bruce and Nancy Gilson, with its expansive view of the Rio Grande Valley. Carol Badget was matron of honor and Denise Gilson (who later went to Tech) served as maid of honor. Bill Grother was best man and Ed Johnson was groomsman. They honeymooned at Chaco Canyon.

All in all, a righteous New Mexico Tech experience.

The newlyweds then moved to Albuquerque where Summers was hired to assist in operating the 24-inch Capilla Peak telescope, and Wise began the M.B.A. program at UNM. Perhaps it was the systemic processes of accounting that attracted Wise, who started out as a bookkeeper for small, scientific-related businesses before enlarging the scope of her clientele. Kumie operates “Wise Bookkeeping Services” out of the couple’s Las Cruces home, often spending a day at the client’s office with follow-up work at

home. With Summers on a one-week-on, one-week-off schedule at the Tucson observatory, where he has a mountainside residence, it’s important for Wise to be available to 15-year-old daughter, Verity, now completing her freshman year at Las Cruces High School. Autumn, 21, is studying math and computer science at Tulane, pursuing a minor in Japanese. (The name “Kumie” means “little one” in Japanese and “braid” in Chinese. She was named for Japanese friends of her parents.)

In 1995, Summers was hired by NMSU as site engineer for the Apache Point Observatory, which brought the couple to Las Cruces. He left several years later when the couple launched a joint business venture, “Hadrosaur Productions,” with Summers as its full-time writer and editor. When NOAO could not find quality applicants for a posted position, the observatory persuaded Summers to return.

“I’ve often felt that one

of the things that really served me well and kept me in management’s mind at NOAO was the very hands-on science education I received at Tech,” Summers said. “Not only did I learn theory, but I learned how to obtain high-quality data.”

“I wasn’t looking for a job when I returned to NOAO,” Summers continued, adding that he accepted the offer with the stipulation he could continue his writing career. He has 10 novels to his credit – four sci-fi, three of the Wild West steampunk genre, two vampire books (one partly set at Tech), and one horror. *Owl Dance* opens in Socorro in 1877, before the N.M. School of Mines was founded, and features the historic Elfecho Baca as a youngster. *The Astronomer’s Crypt* is set at the fictitious Carson Peak Observatory, patterned after the 4-meter telescope at Kitt Peak, with its labyrinthine interiors.

Gladys Dana hosted his first book-signing for 1998’s *The Pirates Sufiro* about space pirates settling



Kumie Wise and David Lee Summers

an imaginary planet on the galaxy's far side.

Summers, who grew up reading Poe and Lovecraft, credits a "Paranormal and the Scientific Method" class taught by New Mexico Tech faculty Steve Shore and Bob Cormack for giving him a "good grounding" in the hauntings described in the *Crypt* novel. A claim to fame is his continuing correspondence with the legendary sci-fi novelist Ray Bradbury, whom Summers met working as a student reporter for Pacific High School in San Bernardino, Calif.

Summers stopped by the

principal's office and was invited to join Bradbury and others for lunch in the school library, where he sat "in stunned silence." After the author's campus talk, Summers spent another hour with Bradbury and other teachers, hanging on the man's every word. In 2001, he sent Bradbury a copy of his first "real" sale, meaning advance money, to *Realms of Fantasy* magazine.

Kumie's reading comprises sci-fi, fantasy, horror – "depends on what catches my fancy" – most anything but romance – and cites a nice, used-book store in the downtown plaza. "I spend a lot of time in

bookstores and libraries," she said. The last time they were in Socorro was three years ago when daughter Verity participated in the Supercomputer Challenge.

As alumni, Kumie and David were involved with the Miner's Ink writing group started by Karen Balch. Balch organized a small convention headlined by Nichelle Nichols, Lt. Uhura of Star Trek fame. Kumie credits Nichols for encouraging Autumn to "stay in school and keep doing good stuff in science."

"We can pin Autumn's interest in STEM subjects to her meeting with Nichelle Nichols ... it made all the difference in the world," Wise said.

Summers met Colgate right after the discovery of Supernova 1987A, which supported a theory Colgate had first proposed in the 1960s; that is, a neutrino burst would precede a supernova explosion, which Supernova 1987A proved conclusively. The recognition also super-accelerated Colgate's status

among astrophysicists, said Summers, who worked with Colgate on automated supernova research.

Summers has several Colgate memories, including the time he introduced Warren Marts to the former Tech president, who said to Marts: "You've probably heard a lot of stories about me, and most of them are true."

Another highlight was meeting William Fowler, the Cal Tech researcher and winner of the 1983 Nobel Prize in Physics, who just happened to be Colgate's post-doc advisor. Fowler was in Socorro to deliver the Jansky Lecture sponsored by the National Radio Astronomy Observatory (NRAO). Afterwards, a group that included Stirling and Rosie Colgate, Fowler, and Summers adjourned to the Capitol Bar where Fowler held court, talking about global warming and climate change as serious problems that needed to be addressed – decades before the terms would become part of contemporary language.

The couple lament a tough time for higher education in New Mexico, when less money in the till forces budget cuts. Summers, however, is optimistic about the future of his and his wife's alma mater.

"I feel encouraged by what I've seen so far of President Wells, from everything I've read about him," Summers said.

He also believes Wells' relationship with former Tech President Laurence Lattman bodes well for the University. "I remember

President Lattman fondly," Summers said. "I found him to be a very approachable president, and Wells seems to have followed that path. I am hopeful."

These days, Summers is a member of the Pluto Support Country, saying he returned to the classroom at NMSU for an astrology degree because of Clyde Tombaugh, who taught astronomy at NMSU and had previously discovered the onetime planet, now reduced to the status of a "dwarf planet."

His hobbies have a way of turning into jobs; i.e., a pastime brewing beer in time earned him medals in N.M. State Fair competitions. And every now and then, Summers enjoys exploring online sources for kitchen stuff. His grandfather was a professional cook and was hired as such by the film crew for a 1939 Jesse James movie starring Henry Fonda and filmed in Missouri.

Their own Spécialité de la maison? Andouille gumbo, perhaps a nod to New

Orleans where daughter Autumn attends college.

Summers admits to being an introvert until he started writing. Wise explains: It's not that an introvert won't talk, it's just that they'll wait until a subject they're interested in comes up, "then they have to go hide for a while, as a way of recharging," with Summers adding that a key difference among people is the way they recharge. He cites the actor who recharges by getting back on stage, then, depleted, retires from public view until the next show.

Travel is high on their wish-list, perhaps enhancing their home base with "something nice to travel in, to annoy our children," Summers said. But no pets: "Children are enough of a pet as it is," deadpanned Wise.

Any last words for Gold Pan readers?

Summers: "I have fond memories of good times, some stressful times, but I wouldn't change a bit of it."

Wise: "Buy Dave's books."
25



David Lee Summers at Kitts Peak Telescope

where are they now

tommie mcsherry

tech grad lands \$100,000 for science lab

New Mexico Tech graduate Tommie McSherry and her middle-school students won a \$100,000 grant to upgrade the science lab at Cottonwood Valley Charter School in Socorro.



Tommie McSherry

McSherry is the science teacher at Cottonwood Valley Charter School. During the spring of 2016, she and her students put together a video application for a Northrop Grumman Foundation Fab School Labs contest aimed at promoting STEM education. In December 2016, they were selected as one of 25 finalists for the award.

“We turned the application video into a class project,” McSherry said. “It was really cool because we got the kids involved. The video generated awareness in the community and we made sure it was community approved. It also allowed us to get local donations.”

McSherry earned her bachelor’s in Biology with a minor in Chemistry at New Mexico Tech. She also earned a master’s in Biology. Once finishing her degrees, she decided that Socorro is a great place for her to raise her children, so she entered the teaching profession.

McSherry has put together a wish list, which will be submitted to the Foundation this summer. “We do have student lab stations, but we’re a long way from having an ideal STEM classroom,” McSherry said. “I have facilities, but no funds to purchase materials. We will be able to increase accessibility for students and supplies and instruments.”

Glassware and computers are at the top of the list of priorities as well as Ph probes, temperatures probes, and pressure sensors.

“We’ll get them hooked up to a computer so we can collect real-time data,” she said. “Students will be learning technology and analyzing data and getting math skills at the same time.”

School Principal Kim Schaffer said the grant will also allow the school to purchase additional furniture that is appropriate for a lab setting, such as cabinetry, tables, and chairs.

“Tommie is an amazing teacher,” Schaffer said. “She pulls together all sorts of applications that can be applied in sciences. This is pretty exciting.”

To help determine the five winning schools, the Northrop Grumman Foundation enlisted the public via a five-day online voting campaign hosted on the Fab School Labs Facebook page. In

addition to the public support received by each school, a final review of the 25 semifinalists was conducted by the Fab School Labs team with the help of the National Science Teachers Association. Votes received by each school on its day during the online voting campaign will be considered along with other criteria to evaluate and determine the winning grant recipients.

The public middle school lab makeover contest provides administrators and teachers with an opportunity to make their dreams of a state-of-the-art STEM lab a reality for their students thanks to five available grants of up to \$100,000 each from the Northrop Grumman Foundation. School administrator Kim Schaffer said.

When she joined the CVCS teaching staff, the school was planning a major renovation, which was completed last year. However, the project did not include laboratory equipment. CVCS will have



Dr. Andrei Zagrai, Karen Bailey-Bowman and Tommie McSherry, grant application writers

the financial resources to purchase instruments like pH probes, temperature and pressure sensors, high-precision electric balances, and other items.

Inadequate funds to purchase equipment and an overall lack of facilities are frequently cited problems by teachers and educators as it relates to science and mathematics education at the elementary and middle school level, according to the National Science Board and other education sources. Lack of funding and inadequate laboratory facilities are challenges faced by Cottonwood Valley Charter School as

well, preventing the staff and community volunteers from adequately teaching, motivating, and inspiring its middle-schoolers in the various STEM disciplines.

Winning a grant of \$100,000 will help CVCS finish transforming its science classroom into a 21st century STEM lab, a place of imagination and opportunity for students, while also helping them better meet the demands of today's fast-paced, technology-driven world.

It took a community effort for the school to land the grant. A "Go Fund Me" campaign led by Lisa Arendt helped raise \$7,000

for the sinks in the lab.

The school also received a \$5,000 Lowe's Toolbox for Education grant for a modular science laboratory counter. Karen Bailey-Bowman assisted with the grant application.

The next phases call for a teacher demonstration counter unit, additional storage for equipment and supplies, student lab tables and stools, student laptop computers, classroom smart technology, digital instrumentation to support student research projects, software, and more.

New Mexico Tech Associate Professor Dr. Andrei Zagrai used his

expertise as a mechanical engineer to help with the grant writing. "Parents, teachers, and students were involved," Zagrai said. "This is an example of what we can do to change lives and make a real difference."

Community support, Zagrai said, is critical at a time when schools are facing more cuts from the New Mexico Legislature because of the budget shortfall.

Schaffer felt Cottonwood Valley Charter School's being a rural part of New Mexico helped in the judging process. "Probably having a strong science program also helped," Bailey-Bowman said.

Funding statewide to support public K-12 education has been cut back because of declining state oil and gas revenue, so public schools like Cottonwood Valley Charter School have had to find other ways to fund projects. The Fab School Lab grant will make a 21st century STEM program a reality for CVCS students.

Graduation

The Class of 2017 was the largest ever at New Mexico Tech. More than 300 students walked in the ceremony, including 245 bachelor's recipients, 45 master's recipients and 10 Ph.D.'s. The Class of 2017 (including those not participating in graduation) conferred 475 degrees. Last year's commencement, the class of 2016, had set the previous record with 430 graduates.



New Mexico Tech has awarded 8,677 Bachelor's degrees in the history of the Institute, along with 3,277 Master's degrees and 459 Ph.D.s awarded.



A few data points about the Class of 2017:

The average GPA of the bachelor's recipients was 3.31.

74 percent had GPAs of 3.0 or greater.

Four graduates had a perfect 4.0 GPA

The youngest Bachelor's recipients were 21 years old and there were five of them.



The most well-represented department was Mechanical Engineering, with 57 Bachelor's degrees awarded. Mechanical Engineering also led with 21 Master's degrees, while Materials Engineering was the most well-represented department at the Ph.D. level, with four degrees

2017



The Class of 2017 was a diverse group. Just over 72 percent of the undergraduates hailed from New Mexico, including students from Waterflow to Carlsbad, from Deming to Costilla – and all points in between.



This year, our international students earning degrees were from China, Colombia, Costa Rica, Croatia, Egypt, Kazakhstan, Ghana, India, Iran, Libya, Nepal, the Philippines, and Turkey.



Congratulations to you all!

awards

myjissa weiss • shangwen zha • samuel collopy • dr. snezna rogelj
 dr. shawn higgins • john dowdle • lauren roberts • dr. francis “frank” greiner • the vigilantes



President Wells and Myjissa Weiss

The **Brown Award** was given to Myjissa Weiss, Class of 2017 and member of the Board of Regents.



Caralyn Coultas-McKinney

The Cramer Awards went to Caralyn Coultas-McKinney and William Sullivan, both of the Chemical Engineering Department.



William Sullivan

This year's voting for the **Langmuir Award** ended in a tie. Instead of trying to determine a tie-breaker, the Faculty Senate decided to present two Langmuir Awards. The winners



Dr. Wells, Samuel Collopy, Shangwen Zha and Dr. Liebrock

were Samuel Collopy of the Physics Department, and Shangwen Zha of the Materials Engineering Department and the Petroleum Recovery Research Center.



Dr. Wells, Dr. Snezna Rogelj and Dr. Romero

The 2017 **Distinguished Research Award** was presented to Dr. Snezna Rogelj of the Biology Department.



Dr. Wells and Dr. Sentic

This year's **Founder's Award** winner was Dr. Stipo Sentic of the Physics Department. Dr. Sentic received his Doctorate in Physics with Dissertation in Atmospheric Physics.



Dr. Stephen Wells, Dr. Shawn Higgins and Dr. Douglas Wells

The **Distinguished Teaching Award** of 2017 was presented to Dr. Shawn Higgins of the Communication, Liberal Arts, and Social Sciences (CLASS) Department.

Several alumni were honored during the 2017 Commencement Ceremony on Saturday



Dr. Peter Mozley and Dr. John Dowdle

in Socorro. Alumnus John Dowdle, Class of 1960, received a honorary doctorate for his many years of contributions to the university and the Alumni Association.



Dr. Wells and Lauren Roberts

Lauren Roberts, '88, was awarded the 2017 New Mexico Tech Alumni Association **Distinguished Alumni Achievement Award**.

Dr. Francis “Frank” Greiner was named the winner of the 2017 New Mexico Tech Alumni



Accepting the award for her son is Dolores Greiner

Association *Distinguished Service Award*.

In 2017, an unusual presentation was made, unusual in two respects. First, the NMTAA awarded two Distinguished Service Awards, and second, it was presented to a group rather than to an individual. The second *Distinguished Service Award* was presented to the musical group known as the Vigilantes.



The Vigilantes accepting the Distinguished Service Award

Earth Science Awards

The former New Mexico Bureau of Geology and Mineral Resources director was presented the 2017 New Mexico Earth Science Achievement Awards in February in Santa Fe for helping shape the field of geology over the course of his career.

Dr. Charles “Chuck” E. Chapin has two wonderful gifts: he has an amazing ability to integrate diverse scientific data sets, and he has an expansive, open-minded, and collaborative approach to science. Over a long and remarkably productive career, Chapin developed many important geologic concepts that shaped our understanding of the location of mineral, geothermal, and water resources in the Southern Rocky Mountains-Rio Grande rift region.

Among his numerous accomplishments are his definition of the Rio Grande rift and his detailed work on ash-flow tuffs in the northeastern Mogollon-Datil and central Colorado volcanic fields. Chapin

was heavily involved in the establishment of the world-class geochronology center at the Bureau at New Mexico Tech.

Chapin’s academic teaching career began at the University of Tulsa, but he soon moved to New Mexico Tech in Socorro, where he taught for five years and served as department chairman for two years. He started working for the Bureau of Geology in 1970, where he served as Director and State Geologist from 1991 until his retirement in 1999. *Lite Geology*, the Bureau’s publication that is aimed at providing geologic information to earth science teachers, was conceived in 1992 while Chapin was director.

During Chapin’s 34-year tenure in Socorro, he supervised 14 Ph.D. candidates and 31 master’s students. After retirement, he has continued to write notable, integrative, scientific papers about the geology of the southwestern United States. Since 2008, he has authored or



Dr. Charles Chapin

co-authored four papers that have appeared in the international, peer-reviewed journal *Geosphere* on topics ranging from the effects of oceans and paleoclimate on sedimentation in the southwestern United States to the origin of the Colorado Mineral Belt.

The N.M. Bureau of Geology and Mineral Resources is a non-regulatory research and service division of the New Mexico Tech in Socorro. For 90 years, the Bureau has served as the geological survey for the state of New Mexico. Nominations for next year’s awards are welcome from the general public and may be made directly to the director of the Bureau of Geology.

people you know

Jeb Flemming, 2000, B.S.,

has started a 3-D printing company in Albuquerque. A design engineer at Sandia National Laboratories, Flemming is the CEO and founder of 3D Glass Solutions Inc. He outlined the company's plan for growth during the Albuquerque Economic Development quarterly investor luncheon at Sandia Resort & Casino in June 2016.



Jeb Flemming

3D Glass Solutions was founded in 2008 and uses an advanced manufacturing process to create heat resistant electronics casings and microprinted circuit boards. Flemming said the technology has potential to replace other materials like silicon. The company is mostly focused on cellphone manufacturing and cellphone components.



Ryder Fox

Ryder Fox

Physics Today published an article by NMT student Ryder Fox. The article, "Dissecting the rapid intensification of Hurricane Patricia," examines how a modest-looking tropical cyclone strengthened into one of the most intense hurricanes ever recorded. Read the article at <http://scitation.aip.org/content/aip/magazine/physicstoday/news/10.1063/PT.5.4025>

Jennifer Knowlton

The Albuquerque Business Outlook magazine reported that Jennifer Knowlton, who has two degrees from NMT, was a panelist at the New Mexico Energy Outlook Summit on November 3, 2016, in Albuquerque. Knowlton is the manager

of Environmental Health and Safety at Agave Energy in Artesia. She earned her bachelor's in 1997 and her master's in 1999, both in environmental engineering at NMT. She also holds a master's of Environmental Law from the Vermont Law School. This year's summit focused on how the evolving landscape of the energy industry will affect New Mexico's economy.

David McMIndes, 2001 MEM/Explosives Engineering

The Missouri University of Science and Technology inducted six individuals into the Missouri S&T Academy of Mechanical and Aerospace Engineers on October 13, 2016. The academy recognizes outstanding alumni



David McMIndes

for their professional achievement and success and provides organized assistance to the mechanical and aerospace engineering department at Missouri S&T. Tech graduate David C. McMIndes of Kansas City, Mo., was among the inductees.

He is the engineering director and chief technology officer for Honeywell Federal Manufacturing and Technologies. He earned a master's in engineering management with a specialization in explosives engineering from New Mexico Tech in 2001.

He also holds a bachelor's in Mechanical Engineering from Missouri S&T (1988), an M.B.A. from the University of Missouri-Kansas City, and a master's in Mechanical Engineering from the University of Missouri-Columbia. McMIndes began his career with Honeywell in 1988, serving in various engineering and management positions from project leadership and program management

to numerous residency positions at several national laboratories.

Dr. Dave Raymond, Professor Emeritus in the Physics Department, was named the winner of the 2017 Jule G. Charney Award from the American Meteorological Society for his contributions to the research of tropical storms.

The prestigious Charney Award is granted to individuals in recognition of highly significant research or development achievement in the atmospheric or hydrologic sciences. The award is in the form of a medallion. Raymond won the award “for profound insights into the interaction between atmospheric convection and the larger-scale environment.”

Raymond won the Charney Award for his significant and ongoing contributions to the study of tropical convection. For more than 15 years, Raymond has conducted field experiments and developed models of global atmospheric convection.



Dr. Dave Raymond
His research focuses on the interaction between convection and tropical weather disturbances, such as tropical cyclones, large-scale tropical atmospheric waves, and the Madden-Julian Oscillation, which is the biggest weather maker in the tropics.

Raymond came to New Mexico Tech as a post-doc in 1973 and joined the faculty in 1974. He earned his bachelor's in

physics from Rensselaer Polytechnic Institute (RPI) in 1965 and his Ph.D. at Stanford in 1970, where he was an NSF fellow for four years. Raymond won the Distinguished Researcher Award in 1995 at NMT.

Igor Gonzales, M.S., Metallurgy, has been named the president and CEO of Sierra Metals. He earned his bachelor's in chemical engineering from the University of San Antonio Abad in Cusco, Peru. Gonzales came to New Mexico Tech as a Fulbright Scholar and earned his master's in metallurgy in 1984.



Igor Gonzales

Born in Peru, Gonzales has over 30 years of experience with major

mining companies with world-class mineral assets. He worked in Minas Buenaventura as Vice President of Operations from November 2014 to April 2017, worked for Barrick Gold Corporation from 1998 to 2013, first as Vice President and General Manager of Pierina Mine in Peru, then President of Barrick South America, and most recently as Chief Operating Officer for Barrick Gold Corporation.

Bureau of Geology scientists **Peggy Johnson, Dan Koning, Stacy Timmons, and Brigitte Felix** won a GSA award for Environmental Geology for their publication about the springs and wetlands of La Cienega near Santa Fe.

The wetlands discharge groundwater from regional and local aquifers provide the sole water source for the southern Santa Fe region. The wetland system is examined by the hydrologic interactions manifested in the wetland water balance. This investigation addresses all aspects of the wetland system.

in memoriam

**William E. Adkins, 1950
B.S. Mining Engineering**

William E. (Bill) Adkins passed away in March 2016 in Truth or Consequences, N.M., at the age of 90. Bill was born in 1926, in Kress, TX, and moved as a young boy with his family to Arrey, N.M.

After graduating from high school in Hot Springs (now Truth or Consequences), NM, Bill enlisted in the U.S. Army Air Corps. After his enlistment ended, Bill enrolled in New Mexico Tech. During his years at Tech, Bill was able to pursue his interests in geology and the outdoors, especially exploring the surrounding area, such as the Kelly mine near Magdalena.

Following graduation in 1950 with a bachelor's degree in Mining Engineering, Bill worked at Kennecott Copper Corporation's Chino Mine in Santa Rita, NM, for the next 35 years, retiring in 1985, after serving as senior mining engineer and mining plant engineer. Although opportunities opened up in other areas, Bill preferred to stay in

southwest New Mexico and at the cabin he built in the White Mountains in Arizona, the places he loved and where he enjoyed hunting and fishing with his family.

He also took pride and pleasure in the number of family members who attended and/or graduated from New Mexico Tech, including his daughter Julie Adkins (B.S. in basic sciences, 1989), his grandson Glen Adkins (B.S. in biology/chemistry, 2006), and his son-in-law Dana Heljeson (B.S. in general science, 1983).

Bill is survived by his wife of 65 years Mary Elizabeth (Myers) Adkins of Elephant Butte, NM, and four children: daughter Marla Adkins-Heljeson (Dana) of Lawrence, KS; son Brent Adkins of Las Cruces, NM; son Gene Adkins (Linda) of Elephant Butte, NM; and daughter Julie Adkins of Tempe, AZ. Bill also is survived by a sister, nine grandchildren, and nine great-grandchildren.

A private family service and interment with full military honor guard was held on March 28,

2016, at Fort Bayard National Cemetery.

Lloyd Ray Alexander, 1972, Metallurgical Engineering, passed away on October 9, 2015, due to complications from heart valve replacement surgery. He was 68.

After graduation, Lloyd had a diverse career that spanned almost 40 years. His resume included positions at Molycorp, Cyprus Pima Mining, Oracle Ridge Partners, San Manuel Copper, and Performance Associates International.

A resident of Tucson, Arizona, Lloyd is survived by his daughter, Laurel, son, David, and brother, Danny. His loss is also mourned by his two long-time friends and former Tech attendees, Dennis Heran and Rocky Kloster.

Jerry A. Detterick, 1956 Petroleum Engineering, died March 6, 2011. He worked for Amoco for 35 years, retiring in 1989.

He had lived in Andrews, Texas, since 1970. He is survived by his wife, Barbara Detterick, daughter, Cyndie Pineda,

three granddaughters, and two great-granddaughters. His son, Mike preceded him in death in 2009.

George F. "Rick" Doehne, 1976, Petroleum Geology 70, of Midland, Texas, passed away Friday, May 12, 2017.

Rick was born January 17, 1947, in Orange, N.J., to Robert and Anne Doehne. He served in the United States Navy from 1969 until his honorable discharge in 1973 plus an additional 33 years in the Naval Reserve. He graduated from New Mexico Tech with a degree in petroleum geology and geophysics in 1976.



George F. "Rick" Doehne

He was employed by The University of Texas System, University Lands for 20 years. Rick participated in various professional organizations

including the West Texas Geological Society and the International Right-of-Way Association. Rick received the Honorary Lifetime Membership Award from the West Texas Geological Society in May 2014.

After his retirement as a Petroleum Geologist, he became the business administrator at Fannin Terrace Baptist Church. Rick also enjoyed serving in the children's ministries at Fannin Terrace for many years.

Rick is survived by his wife of 39 years, Wanda Skaggs Doehne of Midland; brothers, Robert (Susan) Doehne of Ft. Myers, Fla. and James Doehne of San Bernardino, Calif.; niece, Stephanie (Robert) Daugherty; nephew, Jeffrey (Jamie) Doehne; and numerous friends. He is preceded in death by his parents, Robert and Anne Doehne.

Online condolences may be made at www.npwelch.com

Donna Kuklinski, 1983, B.S., Mathematics, passed away unexpectedly on October 27, 2016, in Albuquerque, N.M.

Donna was born in Chicago on May 23, 1961. She graduated from Addison Trail High School in Addison, Ill., in 1979. While in Socorro, Donna made many friends and participated in various Tech hijinks.



Donna Kuklinski

She received her master's in Mathematics from the University of Wyoming in 1989. While in Laramie, she also completed two years of Atmospheric Science studies. Until her retirement, she worked for Northrup Grumman.

She joins her mother in heaven, who passed when Donna was a freshman. She is survived by her father, Mike; her aunt Rosemary; brother, Marty and sister-in-law, Kathy; nephew, Mike, and wife Jessica. She also leaves

her beloved fur-monsters, who have all found new homes. Her favorite quote was "God created the cat so man might caress the tiger." Friends Brian Davis and Johann Lindig have started a scholarship in her name to support future women math majors at Tech. For information on how to donate, please contact Colleen Foster, Development Officer at 575-835-5616.

Jim Lucksinger, 1977, Petroleum Engineering, a resident of Belen, N.M., passed away Monday, March 28, 2016. He was a prominent business owner, and owned and operated J&J Country Mart for 27 years. Jim also graduated from New Mexico Tech, with a degree in Petroleum Engineering and had the



Jim Lucksinger

opportunity to live in many overseas locations. Jim is survived by his loving wife of 53 years, Judy Lucksinger; son, Curtis Lucksinger; daughter, Cynthia Lucksinger-Miller; and loving sister, Kay Alexander. He is also survived by four grandchildren and 3 great-grandchildren.

Marliss Foutz Monette passed away Friday, December 16, 2016. She was born in Gallup, NM, on July 3, 1965, to Arliss and Bette (Jonas) Foutz.

She graduated from Gallup High School and went on to attend New Mexico State University where she received her Bachelor's Degree in business. She was employed at New Mexico Tech for 16 years and was known as a strong and caring student advocate with a positive attitude and can-do spirit. She was an active member of San Miguel Catholic Church and served as a Eucharistic Minister and a member of the Finance Council. She loved Beta Sigma Phi and her sisters.

She was devoted to her family. She met her



Marliiss Foutz Monette

husband Danny while attending NMSU and they married in 1985. She raised three children Rhiannon (Scotty Crespin), Cooper, and Danielle and doted on her two granddaughters, Ryan and Drew Crespin.

A scholarship in her name has been established. For information on how to donate, please contact Colleen Foster, Development Officer at **575-835-5616**.

Herman W. Sheffer, 1963, M.S. Mining Engineering

Herman W. Sheffer, 90 of Cave Creek, Ariz., passed away June 25, 2016, surrounded by family members, not able to recuperate from injuries suffered in a fall.

Herman leaves his wife of the past 33 years, Mary, and five children, Dan (Angie) Sheffer of Fayetteville, Ga., Geordie Sheffer of Santa Fe, N.M., Sara (Todd) Handwerk of Keller, Texas, Kathy Suhr of Flagstaff, Ariz., and Marni (Fredrik) Lambeck of Uppsala, Sweden. He also leaves six grandchildren, Callie Sheffer, Victoria, Jessica, and Emma Lambeck, Daniel and Duncan (Kimberly) Suhr and two great grandchildren, Kaia and Lucas.

Herman was born in Harrisburg, Pa., but was raised in Baltimore, Md. Ever a horse racing fan, in 1938 Herman and his father stood along the rail at Pimlico Racetrack for the celebrated match race between Sea Biscuit and War Admiral.

Herman served in the Army Air Corps during World War II. A graduate of Johns Hopkins University in 1950 with a degree in Geology, Herman played on three national championship lacrosse teams, as well as football and basketball. He began his career at

Harry T. Campbell in Baltimore as a geologist, then returned to school to achieve a master's degree in Mining Engineering from New Mexico Tech in 1963. Herman resumed his career with the Federal Department of the Interior, Bureau of Mines, as a mining engineer, serving for 26 years until his retirement in Socorro, New Mexico, Salt Lake City, Utah, Pittsburgh, Pennsylvania, Columbia, South Carolina, Santa Fe, New Mexico and Washington, D.C.



Herman Sheffer

Herman loved horse racing, golf, the Baltimore Ravens, the Washington Redskins, family, and Mary, not necessarily in that order. He was a member of the Paradise Valley Masonic Lodge in

Phoenix, where he served as a Master Mason.

John William Shipman, 1971, Computer Science Birding, vocal music, cooking, eating, local restaurant reviews and discussing gourmet food, astronomy, reading and sharing books computers, watching professional bull riding, John Shipman devoured all these interests and many more with the enthusiasm of a Renaissance man.

Friends of John's in Socorro, New Mexico, and around the world mourn his passing on January 31, 2017.

Always literal-minded, John was born in Jamestown, N.Y., on Labor Day 1949 to Jack and Martha Shipman. After his father was stationed briefly in Deming during WWII and his parents saw the benefits of snow-less winters, they made the decision that New Mexico offered the ideal place to raise a family and chose Hobbs to make their home. John graduated from Hobbs High School in 1966 at the age of 17 as a National Merit Scholar and with an appointment

to New Mexico Institute of Mining and Technology in the Cooperative Program. John graduated from Tech in 1971 and during his time at Tech found his emotional and spiritual home and interests fired by like-minded people.

He studied Computer Science and upon graduation, had already secured a position with Hewlett-Packard in California. After living the California lifestyle for 10 years, he returned to Socorro and bought a home. He returned to Tech, this time teaching and inspiring many of his students. He was a living example of how widespread interests could broaden one's life. One of John's proudest



John Shipman, in the summer of 1998 Socorro El Defensor-Chieftain.
by Valerie Kimble

achievements was creating a database for Cornell's Laboratory of Ornithology -combining his love of all things avian and all things computer. He put thousands of miles on several cars as he chased rumors of rare or unusual birds in New Mexico and wherever the sightings may have taken him.

After having taken vocal lessons during his California years, he tried out for what was known as the New Mexico Symphony Orchestra Chorus. Having been accepted, he was proud of the fact that in the decades with the chorus, he had missed only two rehearsals, driving the 150 mile round trip as often as required. Music was one of his greatest joys and John sang with vocal groups in Socorro as well as several Tech musicals "Bye-Bye Birdie" and the title role in "Die Fledermaus."

On December 16, John sang in "The Messiah" with the New Mexico Symphonic Chorus. Soon afterwards, John was diagnosed with an aggressive cancer. His wish was to return to Socorro and he spent the last week of his life receiving

a constant stream of visitors at Good Samaritan Village, where he had a beautiful view of "M" Mountain. He died on January 31 surrounded by close friends. John is survived by his sister, Sally Breeden and her husband, Jim, of Albuquerque and family members from Connecticut, New Jersey, Maine, and Pennsylvania.

A scholarship has been established in his name to support computer science students at New Mexico Institute of Mining and Technology. For information on how to donate, please contact Colleen Foster, Development Officer at **575-835-5616**.

Susan A. Sujka

Susan A Sujka (Sue), 71, of Chandler Arizona, died February 1, 2016, after a courageous battle with cancer. She was born October 3, 1944, in Moberly, Mo., to Dr. C.A. Stryjewski and Mary Stryjewski.

She grew up in Artesia, N.M., where her father was the town's physician. She graduated from New Mexico Institute of Mining and Technology in

1966, and then moved to Albuquerque to pursue her career.

She retired in 2004 from a long and successful career of teaching math, physics, and photonics at TVI Community College. After her retirement, she moved to Chandler, Arizona to be closer to her daughter.

She was preceded in death by her loving husband, Bernard Sujka (age 50); her only son, Eric Sujka (age 12); and her parents.

She is survived by her sisters, Sylvia Johnson of Lake Arthur, N.M., and Bonnie Sego of Los Lunas, N.M.. She is also survived by her daughter Kristin Diegle of Gilbert, Ariz.; her son-in-law Chad Diegle, whom she loved like her own; and her two grandsons Dylan and Collin Diegle.

Donald Joe Zeleny, 1967, Physics

Don was born on New Year's Eve, 1945, in Artesia, N.M. He was raised on the family farm where he learned the value of hard work raking alfalfa in the wee hours before school to earn money for his first BB gun. His

trajectory changed from farming to science with the advent of Sputnik in 1957.

This led to two degrees in Physics from New Mexico Institute of Mining and Technology and University of California-Riverside and a 35-year career as a U.S. Navy civil servant at the Naval Weapons Center, Point Mugu, Calif., where he earned an additional degree in Systems Management from USC.

His engineering prowess was instrumental in supporting the Navy's weapons systems. Among his many professional achievements, he served as program manager for the AMRAAM missile and head of the Phoenix/Standard Missile Branch then later led the Weapons Performance Division. All this led to numerous awards including the Pacific Missile Test Center's Executive Director's award, NAVAIR Senior Engineer Fellow, and the US Navy's Meritorious Civilian Service award. He was particularly proud of the Ventura County Big Brothers/Big Sisters Service award that he received in 1987. He was paired with

his last little brother, Jim Diorio, for 34 years. Jim became like a son to Don and his wife of 50 years, O.J., who had no children of their own.

Don developed a love of the arts early in life, playing violin in New Mexico All State Orchestra and singing in New Mexico All State Chorus, plus landing a few stage roles. He enjoyed music and was partial to the classical and jazz genres. Finding Mammoth Lakes in 1978 brought out his love for the outdoors; he bought a condo and learned how to downhill ski. After that he never wanted to travel anywhere but to the Eastern Sierras. He purchased a home there in 1988 with the goal of turning it into a permanent residence upon his retirement in 2005. Don and O.J. worked closely with local architects and general contractors for 11 years remodeling the entire interior of that home, which was completed the end of last year. Don enjoyed reading science fact and science fiction, participating in the local Science Book Club, listening to NPR, watching college

football and Formula One/NASCAR auto racing, and working out at Snowcreek Athletic Club then returning home to share the social interaction experience there with his wife. Locally, he was a supporter of Chamber Music Unbound, Mammoth Lakes Repertory Theater, Eastern Sierra Symphony, Mono Lake Committee, Eastern Sierra Land Trust, ML Friends of the Library, ML Foundation, Southern Mono Historical Society, and Valentine Reserve.

The Zelenys kept tabs on Mammoth Lakes' happenings via local newspapers during their years living in Ventura. Upon relocating, Don delved into local activities where he became a staunch community supporter for music and the arts and volunteered his time as a docent of Mono Lake, an AARP tax-preparer, High Sierra Energy Foundation board member, a STEM volunteer for MUSD, a member of the Measure U Committee (which managed expenditure of \$1 million each year on recreation, mobility, and arts and culture in Mammoth Lakes),



Donald Joe Zeleny

a participant on the Mammoth Arts and Cultural Center business plan review team, and many other roles in which he gave of himself with a passion and presence as if he were born and raised in the area.

Don succumbed to a massive pulmonary embolism May 12, 2017 at his home in Mammoth Lakes. He is survived by his wife, O'Cilla Jane (OJ) Zeleny, a sister, Zelda Zumwalt, several nieces, a nephew, and his "little brother" James M. Diorio Jr.

Should friends desire, please make memorial contributions to Chamber Music Unbound, PO Box 1219, Mammoth Lakes, CA 93546-1219, or to Mammoth Lakes Repertory Theatre, PO Box 1815, Mammoth Lakes, CA 93546-1815.



Meet Tina Güth, a Physics graduate student who truly embodies Tech's spirit of "from gold dust to star dust."

Tina hails from Germany; she and her family moved to Alamogordo, New Mexico in 1999 when her father was stationed at Holloman Air Force Base. Tina received a BS in Physics from NM State University, followed by a MS in Astronomy from San Diego State University. Her outstanding capabilities brought her to Tech to work with Dr. Michelle Creech-Eakman – first as a researcher, then as a graduate student. She received her MS in Physics in 2013, and is currently a PhD candidate in Physics, with an emphasis in Astrophysics, and a Math minor.

Tina's research into the dust composition surrounding Asymptotic Giant Branch (AGB) stars – "dying" stars – will determine which elements are in the dust (i.e. silicates, oxides)

and their quantities. Astrophysics researchers are trying to identify the sources of heavier than helium elements, which are normally produced by exploding stars. But recent studies show that "dying" stars also contribute to the production of heavier elements; this is important because heavier elements, such as carbon, silicon, and oxygen, are commonly related to life.

When asked about the most rewarding and challenging aspects of her research, Tina responded, "The challenge is the best part – it was an especially fun challenge at the start of the project when I had

no idea of what to expect. I had to get used to seeing and interpreting the data; I had to learn what Michelle (Creech-Eakman) was looking at. Our data set is unique and should help advance AGB research."

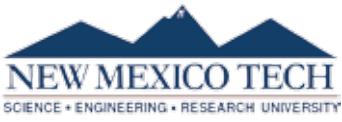
Tina's contributions to her department, to Tech, and to outreach, are pure gold. She has taught numerous classes including Physics I lecture, lab, and recitation, and students seek her out for Physics tutoring. Over the past three years, Tina has served as the Physics Department representative for the Graduate Student Association. She has been a reviewer for Tech's Student Research Symposium since its inception six years ago. She has consistently volunteered for the Science Olympiad, the NM Science & Engineering Fair, Math and Science Night at Socorro's Sarracino Middle School, and much more.

Tina said, "The best thing about NMT is that it is a small campus with so many options to do things both in your department and outside – such as

outreach. You can be more than a student. You have opportunities to stretch your abilities."

Tina's next steps are to defend her dissertation, and then find a teaching or postdoc position. "My ideal job would be one where I could spend half of my time teaching, and the other half doing outreach – getting the public engaged in science, and making science fun."

In the words of her research advisor and mentor, Dr. Michelle Creech-Eakman, "Tina is a truly remarkable, renaissance individual: in research, she is meticulous and detail-oriented, making crucial insights into mass-loss in dying stars; as a teacher with high-standards, she is beloved and sought-out by her students; in outreach she is generous with her time, effortlessly communicating her love of science to people at all levels. I am excited to see Tina attain her PhD and know she will be tremendously missed here at NMT."



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