GOLD PAN

HELLO, WORLD!
THE ROOTS OF NMT Computer Science

GOLF SWING
SCIENTIFIC ANALYSIS QUIZ
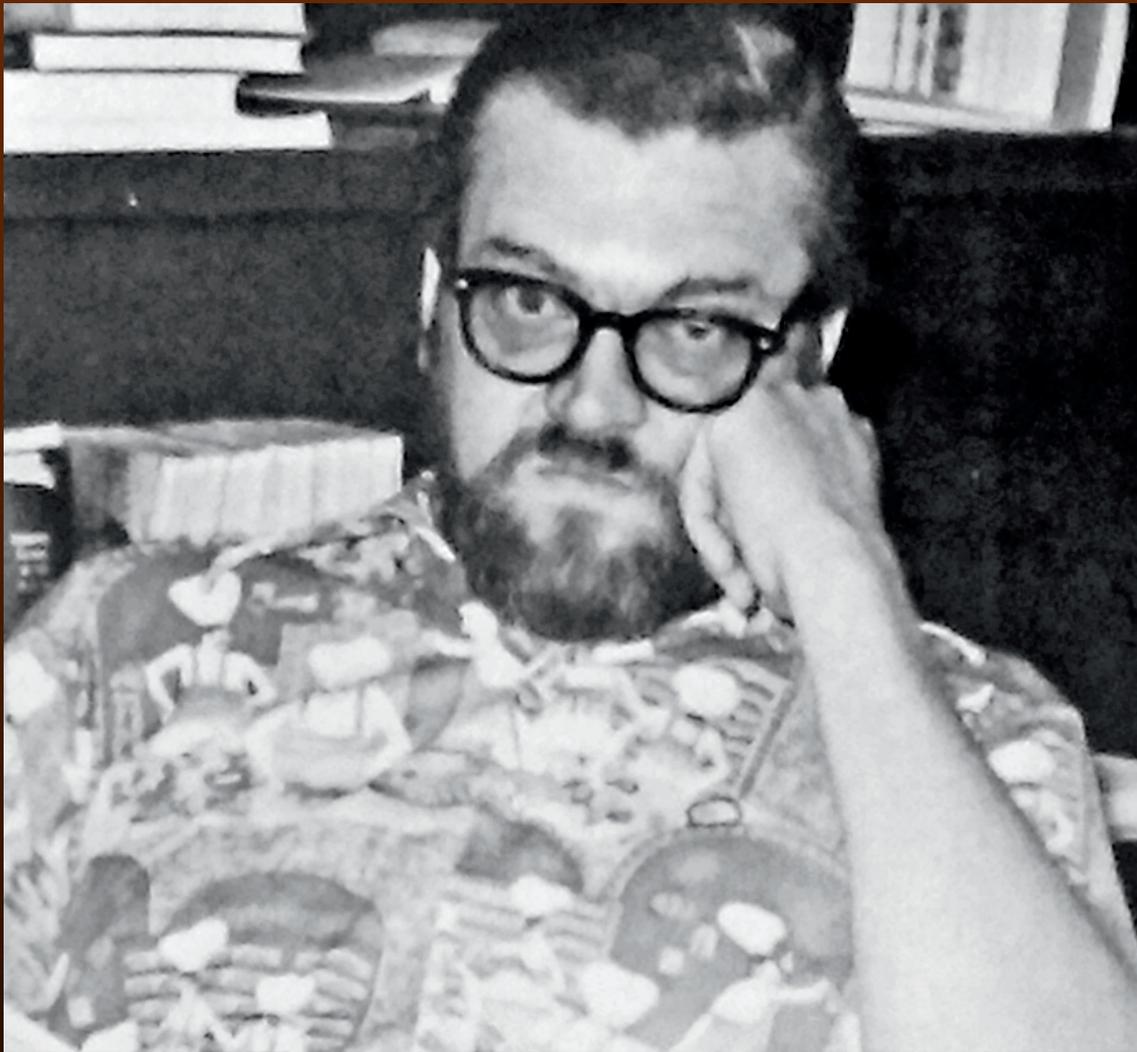
PRESIDENT'S GOLF TOURNAMENT

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____ Ventilation system

____ Optical sensors

____ Connection point

____ Force application point

____ CPU

____ Torque maximum point

____ Trajectory frustration point

____ Power generation

____ Center of rotation

____ Column connections

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SAVE THE DATE
September 9th & 10th
2021

NEW MEXICO TECH
SCIENCE • ENGINEERING • RESEARCH UNIVERSITY

IN THIS ISSUE

49ERS WEEKEND
OCTOBER, 14TH - 17TH

25th

Class Reunion

CELEBRATION

1996

SAVE THE DATES

NEW MEXICO TECH
SCIENCE • ENGINEERING • RESEARCH UNIVERSITY

50th

Class Reunion

CELEBRATION

1971

The 2021 New Mexico Tech Commencement was held off-campus so hundreds of family and friends could attend in person and cheer on the graduating students. 2020 graduates were invited to participate, as well.

With the class of 2021, New Mexico Tech has now awarded 6,321 Bachelors degrees in its history

- **Degrees awarded in 2021**
  330 Bachelor's
  105 Master's
  11 Ph.D.s

- **Most well-represented departments in 2021**
  48 Bachelor's - Mechanical Engineering
  11 Master's – Science for Teachers
  4 Ph.D.s – Earth & Environmental Science

- **Undergraduate GPA in 2021**
  70% had a GPA of 3.0 or higher
  3 had a perfect 4.0 GPA
  Class average GPA was 3.28

- **Geographically diverse in 2021**
  88% of undergraduates were New Mexico residents
  10 were Socorro High School alumni
  International students came from 11 countries

Jose Martinez-Claros, Ph.D., Physics with Dissertation in Atmospheric Physics

"With half your guys math skills, I can't believe you're here today." Classic quote from Dr. Bert Kerr, Associate Professor Mathematics.

Graduates line up to enter

Yellowstone National Park
Alumni Winter Tour
February 24-28, 2022

Enjoy the beauty of Yellowstone National Park on this trip for New Mexico Tech alumni – led by three outstanding geologists: University President Dr. Stephen Wells, NM Bureau of Geology Director Dr. Nelia Dunbar, and Emeritus Senior Volcanologist Dr. William McIntosh.

The trip includes:
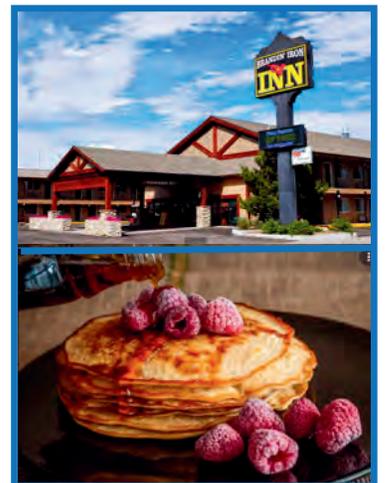- Entry into the Park
- 4 nights at the Brandin' Iron Inn
- 2 days of Snowcoach Tours
- 1 day to explore West Yellowstone
- Meet & Greet Champagne Social
- Daily breakfast at the Inn
- Final Night Dinner

Reserve your spot today!

Please contact Sandi Lucero (sandi.lucero@nmt.edu or 575-835-5618) for information or to join the mailing list for trip itinerary and cost details.

NMT COMPUTER SCIENCE
THOMAS NARTKER - NMT SOURCE CODE

BY MEGAN SCHWINGLE

The early 1960's saw tremendous strides in computer science but the possibilities were just starting to be explored in higher education. Computer science as a stand-alone discipline was still fairly rare and the programs that did exist were graduate level. Dr. Stirling Colgate, NMT President at that time, saw where the future was headed and in 1966 he established NMT's undergraduate computer science program, one of a scant few in the country, and hired Dr. Thomas Nartker to build it.

Dr. Thomas "Tom" Nartker is an extraordinary example of how a curious mind, paired with a humble attitude and a good work ethic, can accomplish almost anything.

After high school in Dayton, OH, Tom attended college at the University of Dayton (UD) just two miles from his childhood home. The university had a good chemical engineering program, which seemed fun to Tom, although he was not sure if he would succeed.

> I wasn't especially a star student in high school and was scared to death that engineering would be beyond my abilities. I worked pretty hard my freshman and sophomore year. I remember ... working every problem at the back of every chapter of the books.... By the time I was a sophomore, I started getting A's in math and physics. *Tom Nartker, 2006 UNLV interview*

After graduation and passing up the temptation to stay at UD an extra year to play basketball, Tom went to University of Tennessee to pursue his Master's, also in chemical engineering. Tom finished "all but thesis" in only one year. It was his intention to go into industry after graduation, but after interviewing with more than 30 companies, no jobs sounded appealing. It was in an interview with DuPont Company, where everyone he would be working with had a Ph.D., that he realized how useful another degree would be.

> The place I really liked was the research environment at DuPont. Then I thought, I don't have a Ph.D. You know, it's not a good thing to be the lowest person [in a department]. *Tom Nartker, 2006 UNLV interview*

After some debate with himself on whether he was smart enough to get a Ph.D., Tom decided to send out some applications to see what would happen. Much to his amazement, he was accepted into several universities. A few months later Tom was off to College Station, TX to start his Ph.D. in Chemical Engineering at Texas A&M.

> I didn't think of myself as a Ph.D. type, a research type. I really thought of myself as a basketball player more than that. But I ended up going on to study because it was fun and because I enjoyed it. I did okay. It seemed like my long-term career path couldn't be hurt at all by it. So there I was in Texas A&M. *Tom Nartker, 2006 UNLV interview*

Thomas Nartker, 1971 Porphyry

Tom arrived at Texas A&M in 1959 with what seemed a clear path to a career as a chemical engineer ahead of him. This path quickly changed with the introduction to his new mentor and officemate, Dave Billingsley.

At 33, Dave Billingsley was Texas A&M's oldest graduate student, with Master's degrees in chemistry, chemical engineer-

ing, and mathematics. Like Tom, Dave was pursuing his Ph.D. in chemical engineering; he was also the resident computer expert. Learning that Tom had a bunch of master's thesis data to process, Dave introduced Tom to the university's IBM 650.

> In 1959 on a keypunch calculator, keying in several hundred data points on several different occasions that needed to be curve fit to a third degree polynomial at least, was a heck of a lot of work back in those days, and I wasn't good at that. I wasn't interested in doing that kind of thing. Dave said, "Oh, here, where's your data?" I showed him my data book, and he said, "Here, copy all this data onto these key-punch forms, and I'll take it over and give it to the keypunch girls, and we'll run this on the computer." I said, "What's a computer?"

> He fired up the 650. It was a drum machine. It made a lot of noise. I remember he went over to a deck of cards and pulled out a subroutine, a canned program to do curve fitting, and put this deck of cards in the machine and my deck of cards behind it and punched the button. Something like 10 or 12 minutes after that, I had the curve-fit coefficients for a cubic equation for all of my experimental data in not only less than an hour, less than approximately 15 minutes time. I suddenly got bit by the computer bug. *Tom Nartker, 2006 UNLV interview*

And just like that, less than six days on the Texas A&M campus, Tom had found a new passion - computers.

Tom's energy soon became dedicated to computers rather than chemical engineering. He spent any free time he had learning the ins and outs of computers from Dave. Together they learned the operating system of the university's new IBM 709 and learned to program in many different languages including FORTRAN, COBOL, and Assembly Language. His interest caught the attention of the Texas A&M computer center director and at the end of his first year he was hired to run the programming lab as well as teach the computer programming class, Industrial Engineering 458, roles he continued throughout his time at Texas A&M.

Working three-quarter time and taking extra computer classes, Tom graduated from Texas A&M with his Ph.D. in Chemical Engineering in 1966. His dissertation encompassed solving problems involving systems of interconnected distillation columns but, true to his love for computers, Tom noted that the most interesting thing about his dissertation was how it was printed.

> I think you are looking at the first Ph.D. dissertation ever to be printed on a digital computer. It was printed in May of 1966. The graduate college decided to allow me to do it, even though the only printers that were available on digital computers in 1966 only printed capital letters. They decided to go ahead and allow me to do it if I would write a page in the back of the dissertation that explained that this dissertation was an experiment, a joint experiment, between the author and the graduate college at Texas A&M University, to determine how a thesis would appear if it were printed on a digital computer. *Tom Nartker, 2006 UNLV interview*

Tom, ahead of his time, wrote on the back of his dissertation,

> It is conceivable that future computers could be programmed to correct spelling errors, properly punctuate and position sentences and even, in some circumstances, suggest a better choice of words. Hand drawn figures in rough form might be touched up and duplicated if properly positioned on the printed page. If audio-translating devices can be perfected, even some parts of the handwriting phase could be eliminated. *Tom Nartker, 2006 UNLV interview*

Development of Tech's Computer Center and Tom's Journey to New Mexico Tech

Dr. Stirling Colgate came to NMT from Lawrence Livermore National Lab where he was working regularly with CDC 6600's. Learning that NMT did not have a computer center, he declared that getting a computer on campus would be one of his first presidential tasks.

Colgate was able to secure about $350,000 in funding from the National Science Foundation (NSF) to establish a computer center but their one stipulation was that he needed to find someone to run it. Tom's resumé somehow ended up on Colgate's desk.

> I picked up the phone one day and he said, "My name is Stirling Colgate and I have a copy of your resume. I'm looking for a computer center director. Would you be interested?" I had never heard of Socorro, never heard of NMIMT. And Stirling said, "Why don't you come on out?" I said, "I just finished flight school. If I rent a plane, would you pay for my rental plane to fly out there?" Stirling said sure... So I jumped in a Cessna 172 and flew to Socorro, New Mexico. Actually, I came in a half-day later than I was supposed to. So everybody was worried I crashed somewhere. *Tom Nartker, 2006 UNLV interview*

Tom spent two days in Socorro and Colgate offered him a job as an assistant mathematics professor and director of the computer center. Tom accepted.

So NMT now had a computer center director but no computer. It was Colgate's intention to purchase a DEC PDP6, but he only had about half the necessary funds. Around that time, IBM came out with their System/360 Model 44 which was reasonably priced and well equipped for the number-crunching required by universities. Tom presented some statistics and cost data to Colgate and they ended up buying the IBM 360 for just about what NMT had in funding from the NSF.

A young John Shipman *(1949-2017; B.S. Computer Science, 1970)* witnessed the computer's precarious unloading by a NMT grounds crew.

> Dr. Tom Nartker, the computer center director, came out of the building to watch the unloading. When he saw the crew trying to lift the box with only a piece of webbing holding it to the forklift, he came unglued and started shouting at the forklift operator to please put it back down - gently. *John Shipman, archived website*

The IBM 360 was housed in the computer center on the second floor tower of the old R&DD building (Workman Center).

Building NMT's Computer Science Program

The new computer was barely unpacked before Colgate came to Tom with another task.

> I wasn't director of the computing center for more than six, seven months, eight months, and Stirling said, "We're going to start a computer science degree program.... I want you to be chair," and I said, "I don't know what computer science is. I don't know anything about computer science. I can't be chair." He said, "That proves it. You're exactly the guy we want. You can help define the field." T*om Nartker, 2006 UNLV interview*

Thomas Nartker, 1968 Porphyry

And just like that, the NMT computer science program was born.

> I found myself...managing his computing center. It was really fun. It was something I really wanted to do. I was really enjoying this because it was still 1966. To actually have my own IBM 360 that I was in charge of, to learn about and to improve my computer science knowledge was a time where I had clearly stopped being a chemical engineer and started becoming a computer scientist. But, of course, no one had ever concatenated the word 'science' behind the word 'computer' at the time. It was about that time I guess that computer science came into being. *Tom Nartker, 2006 UNLV interview*

Tom joined only one other faculty member, **Dr. Ralph McGehee**, to build the program. McGehee was a mathematician and focused mostly on numerical methods and applied math using computers. Tom's interests were programming and operating systems.

Amazingly, NMT was able to offer an undergraduate degree in Computer Science in 1966, the same year Tom started. This is an incredible accomplishment considering most other universities taught computer science as an interdisciplinary degree or as part of other programs like electrical engineering, or only at the grarduate level. Combining what he learned from his time at Texas A&M with extensive research on what master's programs around the country were teaching and some intuition, Tom truly built the program from the ground up.

Dr. Allan Stavely, New Mexico Tech computer science Professor Emeritus and former department chair, commented in a 1984 interview with the Socorro Defensor Chieftain about Tom's knack for knowing what was important to teach,

> [He had a] good sense of what was valuable in the field. Tom would go after what was good, high quality.

Ralph McGehee, 1969 Porphyry

The 1966 course catalog listed classes like Computer Programming, Computer Languages, and Operating Systems, a curriculum that would become more refined as the department grew. The computer science department graduated its first four degree recipients just three years later in 1969.

Interest in NMT's computer science program stayed steady through the 1960's and saw a jump during the early to mid-1970's, coinciding with the department's hiring of additional faculty, including Dr. Stavely and **Dr. Patrick Orr**.

> I would hire the best faculty I could find from different places. As soon as I hired a new faculty member in computer science, I would go take all their courses... [that's] how I got my education in computer science. *Tom Nartker, 2006 UNLV interview*

*Out-programming all competitors, the NMT team won the Mountain Regional Student Computer Programming Contest in October, 1977, in Albuquerque, NM. Team members (l to r) **Joe Franklin**, a junior math major; **Carl Brannen**, sophomore math major; **Jim Darling** (seated), senior computer science major; **Mo Poteet**, sophomore computer science major; and faculty advisor **Dr. Allan Stavely**.*

Tom was also the sort of leader who knew he wasn't the expert in everything, but he knew how to recruit good people and give them the ability to excel. So it was with hiring Pat Orr and Al Stavely, two brand new Ph.D.s, who Tom coached to breathe life into his idea of offering a degree that provided all of the foundational aspects of CS. I didn't realize how good they were until I got to grad school at Purdue, and found that not only was I better prepared than almost any other student from more well-known schools, but I had taken close to half the MS curriculum as part of my BS degree. *Jeremy Epstein, B.S. Computer Science, 1981*

Dr. Allan Stavely, who became known at NMT as Uncle Al, had earned his Ph.D. in 1976 from the University of Michigan, Ann Arbor when he was recruited by Tom to join the NM Tech computer science faculty, ten years after the program officially started.

Stavely's research interest was software engineering and through his experience he was able to add many courses in software and software engineering to NMT's curriculum.

Just six months after Stavely was hired, Dr. Patrick Orr also joined the New Mexico Tech faculty. Orr came to NMT from Cornell University and brought with him courses in deno-tational semantics, formal languages and automata, and design and analysis of algorithms.

A lot of new ideas came from Pat. He had just graduated from Cornell and had a lot of contact with leaders in the field. *Stavely, 1984 interview, Socorro Defensor Chieftain*

Allan Stavely, 1981 Porphyry

The department began a major revision of its curriculum. By 1978 Tech was providing undergraduates with computer science courses comparable to those in master's programs across the country.

We probably had the most advanced undergraduate computer science department in the country. *Stavely, 1984 interview, Socorro Defensor Chieftain*

Stavely's thoughts on the excellence of NMT's computer science department were echoed by industry. Hewlett Packard was an early and consistent recruiter on the NMT campus and other companies noticed as well. A letter, dated 1979, from Burroughs Corporation to former NMT President Dr. Kenneth Ford stated,

Patrick Orr, 1981 Porphyry

I wish to congratulate you on the quality of [New Mexico Tech's] computer science program. We have employed four of your students and found them to be highly intelligent, strongly motivated, and most of all, very well educated.

An additional letter dated 1982 from an undisclosed sender stated,

I am really impressed with the depth of technology existent in your program. It seems that too many schools are still in the process of defining a viable computer science discipline or consider it simply an off-shoot of theoretical math.

Not only was industry impressed by the program but students were, as well. Undergraduate enrollment grew exponentially, from 47 students in 1976 to 130 in 1982. It seemed the department had hit its stride - enrollment was up, faculty

was top-notch, and the curriculum was world-class. Unfortunately, the early 1980's would prove to be a time of great loss as well as growth for the department.

In the fall of 1981, the department suffered a tremendous blow when Dr. Pat Orr was killed in a tragic bicycle accident riding back from lunch at the Owl Cafe in San Antonio, NM. Pat was beloved by students and brought great expertise to the faculty.

The combination of the loss of Pat and administrative changes convinced Tom that it was time to leave NMT that year. He decided to finally try his hand in industry and took a job with Shell Oil.

Pat and Tom were big losses to the department but their spirits endured. Soon after Tom's departure, Stavely took over as chairman. He was a part of the original team that built the world-class curriculum NMT was known for. He built upon Tom's legacy and reputation until his eventual retirement in 2001.

Following a brief stint in Houston, Nartker and his family moved to Las Vegas, NV where he eventually became the head of the Computer Science department at UNLV. His cutting-edge research in optical character recognition brought in millions of dollars to UNLV's Information Science and Research Institute, an institution he helped start. Tom retired in 2011 and passed away on August 13, 2018.
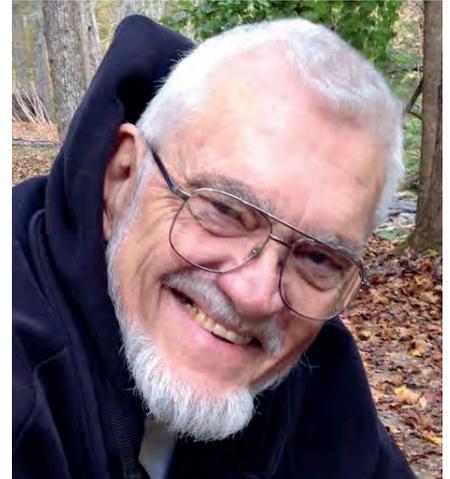
Thomas Nartker in retirement

Since its early days, the NMT Computer Science department has made it a priority to stay current with, and when possible, just ahead of, newly developing technologies and programs. Now the second largest NMT academic department, with around 200 students, they offer degrees in Computer Science, Information Technology, and (transdisciplinary) Cybersecurity. There is a **Women in Computing Science (WiCS)** *program, New Mexico Tech has developed two closely-related* **Cybersecurity Centers***, and the* **eSports student club** *is the most popular on campus. (Ed. note: All bolded items are featured elsewhere in this issue.)*

Plan Ahead
NMT Alumni Events

Annular Solar Eclipse
Alumni Viewing
October 14, 2023
Location: New Mexico

Total Solar Eclipse
Alumni Viewing
April 8, 2024
Location: Texas

Save the Date

50th
Class Reunion
1972

for the 2022 50th Class Reunion

For information, contact
Scott Williams
(832) 217-8680 or wscottw50@yahoo.com

NMT COMPUTER SCIENCE
WELCOME CLINTON JEFFERY, Ph.D.

BY MEGAN SCHWINGLE

Say hello to Dr. Clinton Jeffery, New Mexico Tech's newest Computer Science Department Chair. Dr. Jeffery has been with the university for almost a year, officially joining the faculty in August of 2020.

Dr. Jeffery, originally from Seattle, earned his Bachelor's in Computer Science from University of Washington in 1987 followed by his Master's in 1989 and Ph.D. in 1993, both in Computer Science from University of Arizona. It was during his time in Arizona that Jeffery formed his first connection with NMT.

> I first heard about New Mexico Tech through interacting with John Shipman. He reached out because he was compiling reference documentation and wrote a widely read tutorial on Icon, the programming language that I was working on at the time.

After completing his Ph.D., Jeffery later worked at the University of Nevada, Las Vegas (UNLV) where he met his mentor, NMT computer science pioneer Dr. Thomas Nartker.

> I went to work at UNLV as an assistant professor. I was assigned to a senior faculty mentor based on my general subject area. That mentor was Tom Nartker. He had been teaching the software engineering course at UNLV and I was hired, in part, to take over that course.

Dr. Clinton Jeffery

Nartker was not just a mentor in title to Jeffery but became someone he admired, a friend. Jeffery had the opportunity to connect with Nartker at the tail end of Nartker's career, when he had accumulated plenty of wisdom and stories, some about his time at NMT.

> The single most precious resource if you are a university faculty is the star student researcher. You train many in order to find the few that are actually capable of being productive researchers. Especially at schools where top students are in short supply, the competition for student researchers is fierce, and in my first faculty job, I had a senior faculty mentor who poached two of my best students, insisting that they had to have him as their thesis advisor. I wondered if the same would happen when I got to UNLV. Instead of poaching or competing for my students, Tom Nartker arranged, or at least blessed it, when one of his star research assistant employees decided he wanted to do his M.S. thesis with me. There is just about no greater demonstration of a senior faculty supporting a junior colleague, and that was my experience with Tom Nartker.

> While at UNLV, of course, we shared a fair bit of our personal enthusiasms. Tom was a very enthusiastic guy and he waxed lyrical about his time at New Mexico Tech. And in particular also about the green chile; he was borderline obsessed. On a regular annual basis, he would drive a station wagon full of ice coolers over to New Mexico and load them up with green chile....

Jeffery spent two years under the leadership of Nartker before moving on to New Mexico State University, then the University of Idaho, and now becoming the computer science chair at New Mexico Tech.

NMT COMPUTER SCIENCE
WELCOME CLINTON JEFFERY, Ph.D.

Jeffery came to New Mexico Tech in part to be closer to family in Tucson, but also due to his small-world connection with the university through John Shipman and Tom Nartker. The responsibilities of the department chair are to perform administrative duties that faculty normally do not have the time for. Jeffery provides a better explanation.

A Chair's job is to help the department provide students with the highest excellence of education that they can achieve. In this department, that's usually encouraging them to participate in research in addition to whatever they're able to learn from their classes. As Chair, I provide customer service for the students and also represent and protect the faculty so that they can focus on the important parts of their job: their students and their research.

When it comes to the type of leader Jeffery wants to be, he also channels his mentor, Narkter.

Tom had great faith in the competency of his junior faculty colleagues. He was not a micromanager but trusted them to be experts in their own field while still encouraging them to be the greatest teachers and researchers that they could be.

In addition to his responsibilities as Chair, Jeffery teaches CSE 423, Compiler Writing, a course on translating human-readable programming languages down to the machine code instructions that the computer can under-stand. Jeffery has been appreciative of NMT students.

I was surprised by the excellence of NMT students. I came to New Mexico Tech thinking that I would find the same type of students I have at other universities. And maybe, in fact, the New Mexico Tech students have some amount of excellence because the institute requirements are so high but maybe that's only part of the story. Maybe New Mexico Tech, by its location and its nature, attracts students who are serious about their studies, students who are not divided in their devotion to learn-ing science and technology.

When he is not teaching or fulfilling his duties as department chair, Jeffery likes to spend time with his wife Susan, their two sons, and their newly adopted greyhound. Jeffery is also an avid video gamer, a huge film buff and a self-proclaimed Tolkien nerd. Jeffery has published several books and is spending the summer finishing his next book, titled "Build Your Own Programming Language."

Clinton Jeffery and friend outside Cramer Hall

New Mexico Tech welcomes Dr. Clinton Jeffery and looks forward to the leadership and guidance he will provide to the Computer Science & Engineering department!

Visit our **Giving Page** to see the many ways you can support New Mexico Tech students, research, and activities.
Go to ***www.nmt.edu*** and click **Give** at top right.

NMT COMPUTER SCIENCE
FACULTY SPOTLIGHT - LORIE LIEBROCK, PH.D.

BY LISA MAJKOWSKI

Dr. Lorie Liebrock is Director of the New Mexico Tech Cybersecurity Centers and Professor of Computer Science & Engineering

*We are pleased to announce that Dr. Liebrock has been honored with a **New Mexico Technology Council's 2021 Women in Technology Award**. Congratulations, Dr. Liebrock, on this prestigious and well-deserved recognition!*

Dr. Liebrock, what inspired you to follow a career in computer science and academia?

In high school, I participated in a Summer Institute and then a Career Opportunity Center program. This gave me an introduction to programming; it turned out that I had a strong aptitude for programming, which led me to computer science. I did my Master's degree at Michigan Tech, where I had the opportunity to teach. I found that I loved teaching, especially that "aha" moment with students. This led me to pursue a Ph.D. at Rice University. After I finished my Ph.D., my husband took a leave from Michigan Tech, while we spent a year at the University of Alaska Fairbanks as faculty in the Department of Mathematical Sciences and researchers in the Arctic Region Supercomputing Center. We then went on a search for a location that suited us both and that led to NMT.

What is the "aha" moment?

It is the best part of my job as a professor. It occurs during teaching, when you see the look of wonder on a student's face as they suddenly understand something they were struggling with. As a teacher that is when it becomes clear that you have finally found a way to explain a difficult concept.

You brought *Scholarship for Service* to NMT. This highly successful program has helped many students. What can you tell us about the program?

I actually wrote the proposal for Scholarship for Service (SFS) in the summer before I started work at Tech (June 2002). SFS is an NSF-funded program that provides student scholarships in cybersecurity for one to three years of support, with the agreement that the student will work for the federal government in cybersecurity for the same number of years. In the 19 years of SFS at NMT, about 70 B.S., M.S., and Ph.D. students have benefitted from the program. Because of a high level of diversity in the NMT program, I was asked to serve on an NSF panel to improve diversity at another university. I asked Dr. Dongwan Shin (Associate Professor, Computer Science) to take over leadership of the SFS program when I became Director of the Cybersecurity Centers. That program still continues at NMT.

You are a role model for students and colleagues. Can you tell us about your efforts in this area?

I have made a long-term investment in increasing the number of women in the fields of computer science and cybersecurity. There was a time early in my career at Tech when I was the only female faculty member in the Computer Science & Engineering Department. In my roles as chair of the department's faculty recruiting committee and later as chair of the department, I worked to increase the number of women faculty and female students.

NMT COMPUTER SCIENCE
FACULTY SPOTLIGHT - LORIE LIEBROCK, Pʜ.D.

Through work with the Office for Advancement, we received funding from alumni donors to initiate the **Women in Computer Science (WiCS)** program at NMT, which I oversee. The program is focused on increasing resilience and opportunity for underrepresented students. This includes outreach to K-12 and professional development for the WiCS student club (female and male alike). The WiCS initiative is working - we have 40% female faculty, a 15% increase in women in the freshman class, and started our mentoring and internship database. It is my pleasure to mentor the WiCS Coordinator, **Amy Knowles**, who is funded by the program, as well as WiCS students. Again working with the Office for Advancement, we have just received a major donation to build an education in Computer Science program that will help us and K-12 teachers better address diverse learning styles in computer science.

Dr. Liebrock's 2021 Women in Technology Award presented by the New Mexico Technology Council

Who was Ada Lovelace?

Ada Lovelace was essentially the first computer programmer. She was a 19th century mathematician (and daughter of Lord and Lady Byron), who collaborated with Charles Babbage on the Analytical Engine, a mechanical computer. I host a fun event annually for International Women's Day where we celebrate Ada Lovelace's contributions to computer science. We have a talk that we do for grade school students about Ada's accomplishments. We also do a skit based on Ada and Charles traveling forward in time to learn about how technology has advanced. I portray Ada and sometimes we are joined by other historical women who made key contributions to science.

You are a proficient horseperson. Please tell us more!

I currently have three horses. I got the first horse as a tenure present to myself. He is 16-year-old Paso Fino and a bit crazy; I am the only one who rides him. Then came another Paso Fino - he is a Paint and we think of him as a "war horse" - he can handle anything. My third horse is a Peruvian Paso, who I got a couple years ago and my husband says is the smoothest horse he has ever ridden. The horses have five acres of New Mexico hillside to roam; it's beautiful to watch them run.

One of my horse highlights was going on a ten-mile Peruvian National Club ride while in Peru that was arranged through the Peruvian Paso Association. On that trip, I was able to go riding four times in two days. It was amazing.

To learn more about Dr. Liebrock and her many accomplishments, please view her webpage at https://www.nmt.edu/academics/comp-sci/faculty/liebrock/index.php

NMT COMPUTER SCIENCE
INTRODUCING THE CYBERSECURITY CENTERS

BY LISA MAJKOWSKI

New Mexico Tech is developing two closely-related cybersecurity centers, one focused on cyber-security education and the other focused on research, economic development, and workforce for New Mexico. The two centers are overseen by a single director, Dr. Lorie M. Liebrock, who reports to the Vice President of Academic Affairs on the education center and the Executive Director of the NMT Office of Innovation Commercialization on the research/economic development center.

The NMT Cybersecurity Education Center (CEC) is an academic center at New Mexico Tech that is focused on cybersecurity education at the graduate level. The principal goals of the CEC are to educate undergraduate and graduate students in cybersecurity issues and to pro-vide them with the knowledge and skills needed to work and lead as cybersecurity professionals.

The New Mexico Cybersecurity Center of Excellence (CCoE) is a state-wide research and economic development center. The Center will serve as a catalyst for cybersecurity re-search and workforce development in New Mexico by coordinating and facilitating collabo-rations among NM colleges and universities, government agencies, and the private sector.

From https://www.nmt.edu/cybersecurity/

Meet the Cybersecurity Centers' Team:

Dr. Lorie Liebrock (Director) – I am the Director over both of the centers. My primary role is to build the Centers – put together an amazing the team; establish funding for research, academic pro-grams, and services to New Mexico; and engage with students in their academic and professional development.

Lisa Ackley (Coordinator) – I am responsible for keeping the Cen-ters moving forward and heading in a great trajectory as Lorie casts the vision. The majority of my job is support: supporting Lorie, the team, and especially the students. I primarily focus on the details in all aspects of the Centers including framework growth and finan-cials.

Tish Webb (Outreach Coordinator) – My role in the Centers is to facilitate outreach throughout the state. I coordinate events to edu-cate K-16 students, the public, and New Mexico businesses on cyber hygiene, cyber risks, and cybersecurity employment opportunities. I support our students as they design, create, and present demonstra-tions on cybersecurity related topics and issues.

Justin Markwell (standing, left) and Summer Bronson (standing, right) leading Upward Bound Cybersecurity Training, July 2021

What are current programs and activities hosted by the Cybersecurity Centers? What are the future plans?

Under contracts and grants, we work with the National Security Agency (NSA) on expanding the Codebreaker Chal-lenge, for which we are developing an online community to practice. Strengthening our connection to NSA, our Senior Executive Academic Liaison (SEAL), **Harley Kozushko** is a Tech alum *(B.S. 2003, M.S. 2004 in Computer Science)*.

NMT COMPUTER SCIENCE
INTRODUCING THE CYBERSECURITY CENTERS

For the last two years, we have run a Summer Institute with Sandia National Laboratories. This year we have five students participating in TracerFIRE development. We also have a research contract with Sandia related to open source intelligence research in cybersecurity.

We have a Department of Defense (DoD) contract with New Mexico Economic Development Department to help companies prepare for Cybersecurity Maturity Model Certification (CMMC) to meet current and future DoD contract requirements. This CMMC work is a first step in building the CyberReady initiative, where we are working to build a statewide cybersecurity programs so that New Mexico companies are more competitive in this sector.

We host an online Cyber Cafe to share important information about what is happening in cybersecurity through open conversation. One topic that we recently covered was pros and cons of the Amazon Global Network, which will allow all Amazon devices to connect to each other across private networks.

We are always thinking of new opportunities to share knowledge about cybersecurity. Future plans include expanding our K-12 outreach program to community colleges, collaborating with the City of Albuquerque for senior outreach, and continuing outreach to companies across the state. We are also working with Luna Community College to build a workforce development program for Los Alamos National Laboratory and an educational pipeline with Luna Community College and New Mexico Highlands University (both in Las Vegas, NM) and NMT.

Can you talk more about the impact for students?

The K-12 onsite impact (before COVID) was huge and we are looking forward to being able to once again

(standing, left to right) Summer Bronson and Justin Markwell lead Upward Bound Cybersecurity Training, July 2021

interact in person with the school districts in the state. Prior to the pandemic, we hosted an event in Belen, NM and demonstrated cybersecurity threats and mitigations to about 950 students, their teachers, and staff. During our outreach events, the Cybersecurity Centers' student liaisons walk participants through cybersecurity threats for them and their families, going through a variety of attacks and remediation, and provide fun and useful materials about cybersecurity, such as stickers about creating secure passwords. A parent even followed up by contacting Lorie for more information. **Summer Bronson** – an outstanding student liaison – developed cybersecurity workbooks books to engage students at a younger age. We are currently expanding outreach to community colleges.

We are engaging students at NMT in cybersecurity through events hosted by the Cybersecurity Club. We are reaching out to other organizations – Sandia National Labs, Los Alamos National Lab, Public Service Company of New Mexico – to bring the best real world, hands-on experience to our graduate students. Some very exciting news for Tech students is the new graduate degree programs (Master of Science, Professional Master's, and Ph.D.) in Transdisciplinary Cybersecurity, which officially start in Fall 2021. We are accepting applications for fall admission and the programs are available via distance delivery.

We generally have 20 to 40 NMT students on our payroll, making us one of the largest student employers on campus. Our student liaisons help with outreach, work on research, and produce some of the Centers' materials such as a statewide map of cybersecurity resources. It's also important that our student liaisons receive mentoring and professional development to prepare them for future educational and career opportunities.

What is the best part of your job?

Lorie: My crew – I get to help people across all levels pursue their passion and develop their best future. We have a diverse group of faculty, students, and staff at NMT and across the state who make a great team; I get to empower their collaboration and advancement.

Lisa: The great rapport and relationships with our team, the students, staff and faculty as individuals. It's important to support our students with their academics and everyone we work with through whatever challenges they are facing. The cohesion of our team is unmistakable and I enjoy sharing our positivity across campus. There is never a dull moment and the best way to get through the day is with laughter. Sprinkle that stuff around like glitter!

Tisha: Definitely the students and watching them grow. Sometimes their job with the Cybersecurity Centers is their first, and they might struggle finding their way. We are here to help and support them, with caring mentoring and lots of celebrating their successes!

For more information on the New Mexico Tech Cybersecurity Centers, please visit https://www.nmt.edu/cybersecurity/. For more information on the new graduate degrees (M.S., P.M., and Ph.D.) in **Transdisciplinary Cybersecurity***, please contact [cybercenters@nmt.edu.](mailto:cybercenters@nmt.edu). The Cybersecurity Centers host* **Cyber Café** *every Friday starting at noon (Mountain Time) via Zoom. For more information contact [cybercenters@nmt.edu.](mailto:cybercenters@nmt.edu)*

NMT MEN'S RUGBY TEAM MAKES NATIONALS
2021 Collegiate Rugby Championship

New Mexico Tech's men's rugby program started in 1976. In 2021, for the first time in the program's history, the NMT Miners earned a spot in the Collegiate Rugby Championship (CRC) held May 29-31 in New Orleans, LA.

Coach Gearóid Dunbar, now in his second year at NMT, might be one of the youngest coaches in the country at age 26. He came from Ireland with a plan to make the program a winning one and NMT administration has been supportive, upgrading facilities to improve the team's competitive abilities. Currently a Division 3 team, the plan is to move to Division 1 next season.

NMT Miners in New Orleans

The Miners made it to the semifinals of the Survivor Shield bracket at the 2021 CRC, a great result for the young coach and players. Coach Dunbar sent his thanks to the players and fans:

> I just want to say thank you to everyone for all of your support. I also want to thank all the players who put in a fantastic effort. I am proud of every single one of you and can't wait for next season to start. To all the seniors who played their last game, thank you for all you have done to help grow this program. Anything you need I am a call away. To our fans I hope to see all of you who supported us online out on the sidelines next year to support the boys in blue. ***Go Miners!***

NMT COMPUTER SCIENCE
WOMEN in COMPUTER SCIENCE (WiCS)

BY ELENA TAYLOR

Do you remember ever taking a class and on the first day the professor said, "Take one look to your left, take one look to your right - one of you won't make it to graduation"? ***Amy Knowles***, Coordinator for the NMT Women in Computer Science (WiCS) program in the Computer Science (CS) department, is challenging that way of thinking with innovative classroom models designed to support and retain student diversity.

Adapted after a model from Harvey Mudd president Dr. Maria Klawe, the NMT CSE 113 class, Introduction to Programming, is divided into two groups: silver and blue. Amy Knowles and ***Dr. Rita Kuo*** co-teach the class. Together with a team of four TAs and an army of graders, Kuo and Knowles design curriculum for the blue group (students who have programming experience) and the silver group (students with little to no programming experience). The blue group's assignments focus on integrated concepts while the silver group's assignments help them practice looping mechanisms and logic statements.

Labeling the groups after colors and not, for example, "beginner" and "advanced" empowers students and makes them comfortable asking questions. This model is less intimidating for students without a strong computer science background, which is the case for many women and underrepresented groups who are not historically encouraged to pursue STEM degrees. Many New Mexico students also fall into this category, as most high schools in our state offer no computer science or programming classes.

Designing classes that help retain diversity is what the WiCS program is all about. Knowles says, "Creating diversity within the CS department through the WiCS program helps the entire NMT campus – it makes for better classes and better assignments." Diverse backgrounds lead to broader divergent thinking, which will show up in students' problem-solving skills throughout their careers.

Like many STEM degree programs, the NMT CS program has a history of being overwhelmingly male-dominated. New Mexico Tech was one of the first institutions to offer an undergraduate degree in Computer Science, but it wasn't until 2002 that we had our first female faculty member, ***Dr. Lorie Liebrock***. In 2017, two CS alumni envisioned and initiated the WiCS program through donations as a means to create and retain a greater range of diversity within the CS department, especially focusing on women, at NMT and beyond. Many women are told, directly or indirectly, from an early age that they're not as talented as men in math or science and this creates a reluctance to go into STEM fields.

Amy Knowles, WiCS Program Coordinator

That's certainly the case for Amy Knowles. As a high school sophomore she was told that she would never go on to take higher level math classes and she believed it. "It wasn't until I decided to take a trigonometry class while getting my Master's in History [at Midwestern State University (MSU) in Wichita Falls, TX] that I realized I was good at math and enjoyed the problem solving it entailed." One of the prerequisites to the trigonometry class was completing a computer-based math game – one of those where you have to fill in the wedges to form a circle. She got lost in the game and before she knew it, she had completed the whole circle. Later that week, she got a call from her professor who said that, based on her performance in the game, she should be in calculus. A new door was opened when she realized she had a knack for math-based problem solving.

The next semester, Knowles ran into an old Sunday school teacher who was the chair of the MSU CS department, Dr. Ranette Halverson. Reconnecting with Dr. Halverson helped her discover that CS was a perfect fit for her skills

and interests and ultimately led her to switch from the History graduate program and receive her Master's in Computer Science from MSU in the Spring of 2017. Knowles came to teach and coordinate the NMT WiCS program that year and - great news - has now been accepted into the NMT Computer Science Ph.D. program and will begin this Fall. She'll be combining her interest in linguistics to research a topic under the Grammars Umbrella, which she explains, "In CS, that translates to language grammars (rules that determine syntax), automata (theory behind finite state machines), and programming languages in general."

Since Knowles joined the CS faculty and became the WiCS Coordinator, female student enrollment has risen. By 2019, both the freshman and graduate rates were consistently some of the highest numbers in the past ten years. Participating in college recruitment fairs and planning events designed for women and underrepresented groups goes a long way. This coming December, for example, the WiCS program is set to host an on-campus *exploreCSR* workshop. Twenty to thirty women and underrepresented groups who are currently attending junior and community colleges will research cybersecurity topics and present them during a symposium. With this workshop, WiCS hopes to broaden diversity within their graduate program. Building up not only interest, but confidence, in their STEM abilities helps students see themselves as belonging in the discipline and not the odd man (or woman) out.

If you're interested in learning more about the WiCS program, you can email Amy Knowles at amy.knowles@nmt.edu. *To donate to the WiCS program, please call (575) 835-5616 or go to the NMT Giving Page at* https://advancement.nmt.edu/donate *and select WiCS from the dropdown menu.*

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HELPING TECH - *WITH A SMILE*

BY NANCY BILDERBECK *(B.S. BIOLOGY, 1976)*

I am financially supporting New Mexico Tech with a Smile. Perhaps you would consider joining me!

In a recent *Gold Pan* the Office for Advancement mentioned donating to Tech using **AmazonSmile**. I was reluctant to explore this, perhaps because of an "Old dog, new tricks!" moment. Was there a catch? Would it be difficult to set up?

In the end I did my research and took the plunge.

AmazonSmile offers the same items, prices, and benefits of its big brother company. When users shop on Amazon-Smile, the retailer's Foundation contributes 0.5% of eligible purchases to the charity of your choice.

BUT, how easy was it going to be to set up?

All of my regular Amazon account details were automatically transferred to AmazonSmile - purchase history, delivery addresses, wish list items, etc. Of course, I needed to designate a "charity" – selecting the **New Mexico Tech Foundation** was a snap!

Independent reviews of using AmazonSmile describe it as "effortless" and I would agree. It is also reassuring to know that there is no cost to Tech or me, and 100% of the donation generated from eligible purchases goes to the University.

I would encourage you to investigate this giving opportunity and also encourage you to consider selecting Tech as your charity of choice. Start shopping and supporting NMT at: https://smile.amazon.com/gp/chpf/homepage?orig=%2F!

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NMT COMPUTER SCIENCE
ALUM MEMORIAL SPOTLIGHT: JOHN SHIPMAN

Photo courtesy Dave Thomas

Recognizable across the NMT campus and around Socorro, Bosque del Apache, Albuquerque, and endless horizons, John Shipman (B.S. Computer Science, 1971) was interested in so many things. He was friendly, outgoing, enthusiastic, and, most of all, knowledgeable.

His family, friends, colleagues, and associates were invited to share a favorite memory of John for this issue – and the resulting flood of responses was too great for a single issue of Gold Pan. We have included as many as possible; some have been edited for length.

Sally (Shipman) Breeden *(John's sister)*

There are so many stories I could tell, like the St Patrick's Day broom-swiping episode when John was tasked with jumping a low fence around a dog-infested front yard to get the broom from the front porch - which was nailed to the wall! He was immensely proud of his membership in the Sophomore Higher Intelligence Team (you supply the acronym) and I would be quite sure our parents never heard that!

At Hobbs High School, he was often in trouble in Mr. Rockwell's Advanced Calculus class because he would be reading a FORTRAN book inside the calculus book and "Rocky" would catch him. Catching him wasn't really an issue because John knew exactly what was going on in class and always had the answer.

One story stands out above the rest. In the mid-1970s, when Jim and I were stationed at Wheeler Air Force Base in Hawaii, John and our mother came for a visit. We lived on the Base near the airfield where the Air Force O-2s and the Army's helicopters shared the runway. At the western end of the runway was a small "canyon" filled with trees and flowers – and apparently birds! John walked to that area after Jim left for work, taking his camera, which had a striking resemblance to a rocket launcher. Jim later returned with John in tow - after having gotten him released from the Army's Security Police! They confiscated his camera but returned it after developing the film. John was so focused on the task at hand that it never occurred to him that he might have just slightly bent the rules.

After my husband and I returned to Albuquerque, John would appear regularly to see if Christmas dinner met his culinary expectations. John and I had the obvious sibling connection but it was as if he'd known Jim all of his life. I miss those talks and the laughter we all shared.

Frank Etscorn *(Professor Emeritus, Psychology and Education)*

John Shipman: My "*buddy*?" He was a family friend!

He came up to Wyoming and found three new birds and had an absolute fit! A hoot to see him flying back to the house on a four-wheeler to tell us. He visited us in Corrales when we came back to New Mexico; we listened to some music and chatted. In Socorro we used to hang out

A drop-by at the Etscorn house in Corrales
(Photo credit: Frank Etscorn)

in the back yard and do astronomy until sunrise - both of us with 13" telescopes. We'd go up to Water Canyon, to South Canyon (where he fell backwards into a cholla and scared some poor napping cows!), or to Mount Withington for over-nighters. We used to do a lot of cooking, especially at our Socorro house. On many Friday nights we might have some students and a few professors over and we'd cook Asian food until we ran out of stuff to cook - then it was astronomy out back.

He hooked me on astronomy by asking "Do you know these stars?" and pointing. I said I know the Big Dipper, I know Orion and a few others. He says in two summers you're gonna learn all the constellations, Messier objects, and you're gonna learn stars and by darn I did! I had to!!

He was a NMT superstar if there ever was one. We'll never know how many students he influenced and not just in computer science. Anybody who knew him quickly realized he was really, really off the charts brilliant. He was a Tech fixture. Honored to have been in his orbit.

Dave Thomas *(B.S. Mathematics, 1977; B.S. Physics, 1979; M.S. Mathematics, 1980 - Staff Scientist/Software Engineer, IRIS-PASSCAL)*

I remember fondly my trips to visit John at his Tech office, hidden in the depths of Speare Hall, a "Little Siberia" sign posted to show the way.

I also had many visits with John in his home, which had an exceedingly high degree of entropy. The entire house was like an extended, cluttered desk, with sockets found here and there to provide access to the internet. John was a consummate conversationalist. After we had tended to the matter at hand (usually arcane topics such as binding keystrokes in Python), we would turn to discussions of alien life, logic puzzles, political pseudoscience, religious influence on government, you name it.
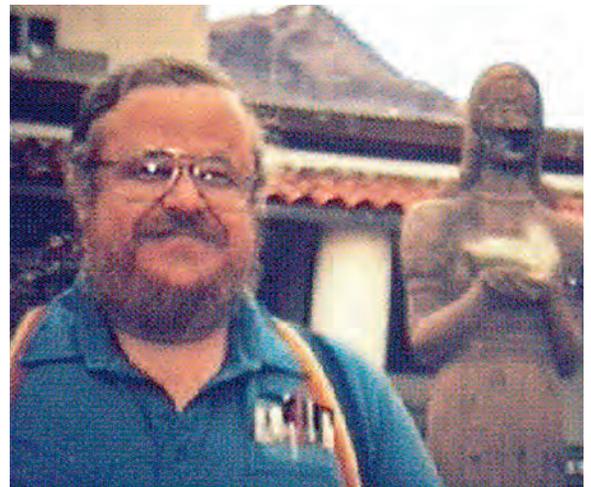
John in front of the Maiden, with famed pocket protector in full view. Photo courtesy Dave Thomas

As an illustration of John's influence, the following memo was sent to the office at IRIS/PASSCAL:

> A snafu at work has staff saying this today:
> "John Shipman programming tip - Never let 'the system' set your default values."

Damn, he was right again!

For a lark, late one night I posted just the image of John's pocket protector on a Facebook page, and said simply "Name That Techie." Just a few hours later, **Bandit Gangwere** (*Bachelor of General Studies, 1981*) weighed in with the correct identification!

David Burleigh *(Professor and Chair, Materials & Metallurgical Engineering)*

I really enjoyed knowing John Shipman. He wrote a lot of instruction manuals, including the first LaTex templates for the M.S. and Ph.D. theses.

Photo courtesy Dave Thomas

NMT COMPUTER SCIENCE
ALUM MEMORIAL SPOTLIGHT: JOHN SHIPMAN

Epiphany Episcopal Church's Wassail celebration in December 2016. Photo credit: Lois Phillips, Lecturer, CLASS Department

Calvin Hedgeman (*B.S. Mathematics, 1970*)

John and I were classmates from 1966 to 1970; he pursued computer science while I studied math. I don't remember how John (from New Mexico) and I (from New York) became friends. Nevertheless, in 1968 John excitedly called me to his room and recommended that I listen to two music albums by a band that I'd never heard and played one of the albums for me. I was stunned by the music - not just swept up by John's excitement but fully sharing it. Two years later, that band's music carried me through the personally difficult transition from college life to military life. Over the next fifty years the music that John introduced me to led me to explore musical genres that I would have totally missed without his introduction. I'll never forget John or his enthusiasm for the music, and I always think of John whenever I listen to his music. Thank you, John.

Bob Knight (*B.S. Computer Science, 1976*)

For some reason, John decided I was worth mentoring when I was a freshman. Over the years, his advice was sage and well-considered.

William Colburn (*B.S. Computer Science, 1977*)

One time we saved up empty 12-ounce soda cans in the VAX office and filled the hallway to his office from door to door with cans stacked floor to ceiling. We exited his office through a window and pulled it closed. The door to the hallway opened inward, so it couldn't be opened, and he (or Dr. Stavely) had to go in through the window from the outside.

He had a bunny rabbit suit that he sometimes wore to teach class.

Frances Deters (*B.S. Biology, 1986*)

My favorite memory is the wonderful curries he brought to the potlucks. It's how I got introduced to Thai curry. I would hear his booming voice talking to someone at the party and I would immediately go and look for those curries. He was a wonderful man - always encouraging, always happy.

Rheda Brown (*Master of Science for Teachers, 1989*)

I remember John from many music experiences, but [especially] the time when NM Tech did the musical BYE, BYE, BIRDIE (spring of 1997 or 1998). John was my husband; we were parents of Kim, who was going to have 'one last kiss' from Conrad Birdie (an Elvis type) going into the army. The two songs I remember well that John and I sang were "Ed Sullivan" and "Kids;" both were really fun to sing. John was such a great person, very positive, lots of fun, great singer, and always upbeat! He was such a Great Guy!!!

John singing, one of his favorite hobbies. Photo courtesy Dave Thomas

John Goshy (*B.S. 1991, Physics*)

I was a student [when] John returned to NM Tech to teach computer science. I took a TEX class and a C class from him. He made the classes fun and entertaining: he knew those subjects well and would give us good anecdotes about such things as the nuances of C syntax (if you make a typo, the code will still likely compile, but it may do something vastly different than you intended). John taught us to use a trained eye to look at source code to see it for how it was, to deal with it as not only a riddle or puzzle, but as something that can quickly provide good answers to problems

John would integrate stir fry recipes into TEX examples, so we'd have very beautifully typeset assignments. He told of 49ers hazing rituals during his freshman year at NM Tech, where he and others had to use buckets to remove various debris and glop from a water fountain near the Administration building.

Jack Bender (*B.S. 1991 and M.S. 1998, Chemistry*)

Shipman was part of a cooking group that we had for several years including some Techies like **Ray Piworunis** (*B.S. Physics, 1983*), **Dan Lunceford** (*B.S. Computer Science, 1990*), **Kirk Hollis** (*B.S. Chemistry, 1985),* **Superdave [Raymond]**, **James Robnett** (*then Manager, NMT Computing Center*), etc. Most took a turn cooking for the rest. We would meet on weekend nights and spend hours together talking about what we ate growing up and enjoying each other's company. John was a staple of the dinners. I do not remember him ever cooking a meal, but no one would have ever considered a meal night without him. A dinner was not a dinner party without him. Ever present with his little notebooks where he would capture particularly good jokes or stories, he could carry the conversation for the entire evening. Magical!

The memorial plaque at the Etscorn Observatory, dedicated February 18, 2019. Photo courtesy Dave Thomas.

David Baird (*B.S. 2005, Electrical Engineering*)

I met John through the Python and XML classes he taught. He gave me XML superpowers, and his documentation on XPath was a de facto reference I used for several years.

One inspiring idea passed on to me by John is that software can really, truly be implemented correctly. He particularly advocated a technique called Zero-Defect Programming, conceived by his friend Dr. Allan Stavely, which emphasizes writing concise specifications ("intended functions") for each routine of a program. I cannot say enough thanks to John for being an inspiration through the knowledge and ideas that he eagerly shared, and for his friendship.

Michael Ruth (*B.S. Materials Engineering and B.S. Mathematics, 2009*)

He embodied each of the best qualities a Techie could possess. I met John at Macey Center during a rehearsal for something, maybe "Orpheus and The Underworld" or a chamber choir thing. It helped that we shared similar interests: obviously singing and music, but also swimming, culinary arts, programming, shenanigans (check out his tale of the great rock removal at https://web.archive.org/web/201111113082235/http:/infohost.nmt.edu/~shipman/write/rock.html).

My fondest memory of John has nothing to do with my career [or] hobbies. I moved to Buffalo, NY in 2009 to be with my fiancee (**Dawn Sweeney**, *M.S. Geochemistry, 2006*), I couldn't find a job and was broke. I needed a special Christmas gift,

an ornament representing our proposal (I proposed to her under a streetlight in Buffalo). I asked my friend John because I knew he was a model railroad enthusiast (add that to the list of his talents) and he helped me produce a fantastic reproduction of the scene. To this day, it's my wife's favorite Christmas tree ornament.

John "Bryson" Tidman (*B.S. 2012 and M.S. 2015, Mechanical Engineering*)

I have a lot of memories of John. We were in the New Mexico Symphony Orchestra (NMSO) together when I was a freshman at NMT. I remember learning that he was both in the NMSO and worked at NMT. It kind of blew my mind because he had a really amazing singing voice. He was always quick with a kind word and really was a very smart guy. He loved a good pun too. I can remember more than once I'd stop by his office and throw a quick pun his way. He always chuckled, even if it wasn't funny. I miss talking to him.

Andres Quan (*B.S. Computer Science, 2019*)

The CS department was hosting a (now old-fashioned) chatroom, an Internet Relay Chat (IRC), and as a freshman new to CS, the IRC gave me a space to ask anything about Computer Science or, more generally, how college works. John was one of the most active members on that chat. He always responded to my questions with some kind of joke response and then a serious answer. It was like having an advisor continuously available to talk to about school, life, the inner workings of the CS department, getting set up with accounts and resources, and getting pointed to useful resources for learning more about a concept I was struggling with in class.

I appreciated him virtually and I really was disappointed I would never get the chance to meet him in person. He was genuinely helpful to the start of my time at NMT.

And a final appropriate memory of John:

Eric Koenig (*M.S. 1992, Geology*)

Memory of Shipman-*hakase*: I visited with John briefly in his last weeks, and he told me a nurse at the hospice asked him how he came to have so many friends, for she had never seen a patient with so many visitors.

He remarked that to have friends, you have to **BE** a friend.

If you would like to make a tribute gift in John Shipman's memory at any time, we invite you to donate to the **John Shipman Scholarship fund** *on our Tribute Page at* https://advancement.nmt.edu/tribute.

Frank Etsorn speaking at Shipman's memorial service on February 25, 2017 at the Bosque del Apache National Wildlife Refuge. Photo courtesy Dave Thomas.

Do you have an address, email, or phone number update?
Prefer to go digital only? Really prefer postal mail, instead?
Have big news to share - family, career, interests?

Send an email to **rebecca.clemens@nmt.edu** or call 575-835-5292
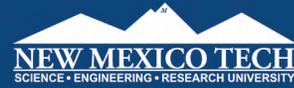
NEW MEXICO TECH
Scholarships

New Mexico Tech prides itself on offering an affordable, high quality education and consistently ranks in the top tier when it comes to return on investment for students. However, even Tech cannot escape the reality of the rising cost of higher education.

- *84% of the 2019 class took out some sort of student loan, borrowing an average of $20,639 per student.*
- *Of the students who were awarded need-based aid, only 24% had their need fully met.*

Even students who qualify for need-based aid are having to find other ways to make ends meet, making NMT scholarships more important than ever.

In addition to helping those with the greatest need, scholarships give students of all income levels access to higher education, and fill the gap for students who fall between low and high income levels. Scholarships give students more time to focus on their studies, decrease student debt upon graduation, and teach students the importance of giving back.

ENDOWED SCHOLARSHIPS

One of the best ways donors can help NMT students is through establishing an endowed scholarship. With a commitment of $15,000, donors can support New Mexico Tech students now and in perpetuity.

A donor's initial principal gift is invested with the NMT Foundation and 3.75% of the interest is awarded annually as a scholarship. Donors are able to name their scholarship and specify criteria like GPA, discipline, financial need, etc.

An endowment of $15,000 will typically award a $500 annual scholarship.

ONE-TIME AWARDS

Donors who are currently unable to endow a scholarship are still able to help students on an annual basis through one-time scholarship awards. Typically, the minimum for one-time awards is $2500. Donors who establish an award also have the benefit of naming their award and determining the award criteria.

If you'd like to explore how to make an impact for New Mexico Tech students through establishing a scholarship or award, please contact **Megan Schwingle at megan.vanwinkle@nmt.edu or Colleen Foster at colleen.foster@nmt.edu**

Contact Us : Phone (575) 835-5353 | megan.vanwinkle@nmt.edu
www.nmt.edu/advancement

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21-22 SEASON CALENDAR • SCHEDULE SUBJECT TO CHANGE

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ELIZA GILKYSON & ROOSTER BLACKSPUR

Thu 10/7
CATAPULT

Fri 10/22
TERRANCE SIMIEN & THE ZYDECO EXPERIENCE

Fri 11/19 — FESTIVAL OF THE CRANES
BARACUTANGA

Sat 12/18
MARIACHI CHRISTMAS

Tue 1/18
LIGHTWIRE THEATER'S DINO-LIGHT

Fri 1/28
PINK FREUD

Sat 2/12 — VALENTINES DINNER
BIG BAND ON THE RIO GRANDE

Fri 2/25
EILEEN IVERS BAND

3/25-3/26
WOMENFEST

Fri 4/8
STATE STREET BALLET'S JUNGLE BOOK

Fri 4/29
JARABE MEXICANO

PRESIDENTIAL CHAMBER MUSIC SERIES — FREE!

Dr. Stephen G. Wells
New Mexico Tech President

Thu 9/30 • NM Bach Society
Fri Nov • TBD
Fri 1/21 • Rahim AlHaj Trio
Fri 4/1 • Eric Sewell Piano Quintet

SOCORRO SESSIONS MUSIC FEST

$10/Vehicle
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Macey Parking Lot

SOCORRO SESSIONS SOCIAL DISTANCE MUSIC FEST

Tailgate & picnic concerts featuring Socorro & NM's best bands!
Dates: 8/21, 9/25, 10/30, 3/26

Thu 11/18 • 7pm
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NDI-SOCORRO PERFORMANCE

Sat 2/5 • 10-3pm
FREE
COMMUNITY ARTS PARTY

Mon 7/4 • 1-10pm
FREE
4TH OF JULY CELEBRATION

Sameh Eisa *(Ph.D. Mathematics, 2017)*

I have been offered a tenure-track assistant professor position in the prestigious Aerospace Engineering and Engineering Mechanics department at University of Cincinnati. The aerospace department is the second oldest in the United States and had Neil Armstrong as a professor from 1971-1979. Before joining this department, I was a researcher and lecturer at University of California, Irvine. Some of my NMT Ph.D. work has been published in top journals - one article was picked up by the news!

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Kevin Healy *(B.S. Physics, 1993)* is lead astronomy faculty and planetarium director for Mesa Community College. He designs his own planetarium shows using Blender and Digistar 6.

Anne Cedergren-Healy *(B.S. Biology, 1993)* is lead microbiology faculty for Scottsdale Community College and part-time instructor for Northern Arizona University. She also belongs to a research group developing evidence-based techniques for improving community college retention and graduation rates.

They celebrated their 26th wedding anniversary in June, 2021 and report, "Our kids are happy to return to their schools in person this fall. We have discovered a few things about teaching online that we like and Anne will continue to offer at least one microbiology section online in future semesters. We plan to visit New Mexico and NMT this summer."

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Joe Milbourne *(B.S. Metallurgical Engineering, 1974)*

Joe and Simone

I've been living in Vancouver, BC since 2001 and really enjoy it. Not the best place for my hobby of amateur astronomy (16" Dobsonian and 100 mm astronomical binoculars) due to the ~2m of annual precipitation but we do have great twisty mountain roads where I can scoot around in my various vintage rides (928GTS, 500 E).

We are well into the BBQ season and are maintaining the traditions learned during our many years in Houston, TX and in Brazil. With the warm weather we enjoy the Brazilian tradition of *churrasco* and fondly remember friends and family there. Amazingly, Whole Foods here usually gets a big shipment of Hatch green chile in September/October and I roast and freeze them for use throughout the year. Plan on trying some of the **NMT 2018 Chili Cookbook** recipes - "Janet Bilderbeck's Famous Chile Rellenos Casserole" looks like a good one!

I have been working full time from home since 2007 so the pandemic did not have much effect on me except that I don't travel to our project site in northern Brazil. We got our second vaccine in June and hope that the border will open sometime this summer allowing car travel - hopefully to the Historic Car Races in Monterey, CA. Best wishes to all.

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Robert "Bob" Winn *(B.S, Metallurgical Engineering, 1983)*

After spending 38 years making, shaping and treating steel. I retired this year in March, and plan to spend the rest of my days doing just whatever I want. So far that has included looking in all the nooks and crannies of Colorado, taking my first hot air balloon ride, going to Oahu and so much more.

My wife Kristy and I have plans to build a cabin, enjoy our grandbabies if and when they come, and in the meantime our grand-dogs. Hope everyone I knew and loved are safe and rolling along on this road of life.

Bob and Kristy

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Melvin Jay Hatch

Emeritus Professor,
Chemistry Department

Melvin Jay Hatch passed on to the next life at the age of 94, on April 5, 2021. He was born in Winslow, AZ on October 20, 1926, the fourth child of Ezra Ralph and Ida (Lewis) Hatch. He grew up in Holbrook, AZ, where even at a young age he was well-known for his artistic ability and his consuming interest in science.

After earning his B.S. in Chemistry from the University of Arizona, Melvin completed a Ph.D. in Organic Chemistry at UCLA under the guidance of future Nobel laureate, Donald J. Cram. As a Research Scientist at Dow Chemical Company in Midland, Michigan, Dr. Hatch's work resulted in over 50 U.S. patents.

After 15 years in industry, he combined a growing interest in teaching with a desire to return to the Southwest when he accepted a professorship at New Mexico Tech. His enthusiasm and desire to inspire future chemists, as well as his humor and geniality, made him a much loved professor.

Gifted with prolific creativity, Dr. Hatch continued to research advancements in polymer and ion exchange chemistry. At the age of 90, when one of his inventions was put into production, he used the patent royalties to endow the **Melvin J. Hatch Chemistry Pentathlon Prize** at New Mexico Tech, still desiring to encourage and support young chemists.

A lifelong member of the Church of Jesus Christ of Latter-Day Saints, he devoted countless hours of religious service and leadership within the Church's lay ministry, serving as spiritual head of congregation (Bishop), and filling many other church callings with devotion and dependability.

Melvin married the love of his life, Martha ReJune Stewart, in 1958 after a storybook courtship. He was a loving husband, a kind and benevolent father to their three children, and an ideal grandfather to his many grandchildren and great-grandchildren. Mel was known for his cheerful disposition and his wit and wisdom. His hands were always busy making and repairing whatever needed his touch, including counseling and blessing his family members.

He is preceded in death by his son James Murray Hatch and by Martha, his beloved wife. He is survived by daughters Catherine Clark (Ted), Patricia Hatch (Benson Whittle, deceased), daughter-in-law RoseAnne Sanchez Hatch (Steve Norbut), 22 grandchildren and 16 great-grandchildren.

Alan Robert Miller

Emeritus Professor,
Engineering

Alan Robert Miller, age 89, passed on July 1, 2021. He is survived by his wife of 63 years, Mary Louise Miller, daughter Heidi Sims and son Sheldon, six grandchildren, and eight great-grandchildren.

Faculty from Mechanical Engineering shared memories of Dr. Miller:

We have lost Dr. Allan Miller - a professor who contributed to computer literacy worldwide and shaped several New Mexico Tech departments and the Socorro community. He was a dedicated Materials professor, avid computer enthusiast, and a founding chair of the Mechanical Engineering department. I met Dr. Miller when he was "semi-retired" - meaning he never retired completely and was contributing to many day-to-day department activities including support for our computing facilities.

An interesting fact about Dr. Miller is that he was among those who made the beginning of the computer revolution possible. Albuquerque was a center of computer development at that time and he was in a close knit circle of innovators. Dr. Miller personally knew Bill Gates and communicated with computer pioneers. He immediate saw the potential of computer applications to education, science and engineering. Perhaps his greatest contribution to the field was the

popularization of computer use and programming through a series of books translated into many languages. Dr. Miller was a true encyclopedist and multiculturalist. Later in his life he traveled around the world and brought a multicultural perspective to the Socorro community. He will be deeply missed by all of us.
Andrei Zagrai, Ph.D.
Professor, Mechanical Engineering Department

The Tech community has had a big loss. Dr. Miller was a first chair of the Mechanical Engineering department. I knew Dr. Miller since I joined Tech in January 2005; at that time he was already retired. Even so, he actively participated in building our department and its programs. He was a great mentor and friend to our students and young faculty. Alan Miller will be missed dearly.
Sayavur Bakhtiyarov, Ph.D.
Professor, Mechanical Engineering

Dr. Miller was one of the members who pioneered the initiation of the Mechanical Engineering Department. The name of the program was Engineering Mechanics at that time and it became Mechanical Engineering later. He continued his active involvement in the department matters after his retirement by attending department meetings and helping with departmental tasks. I was a fresh junior faculty at that time and he often visited my office; he was eager to offer help and to answer my disorganized questions. Sometimes he shared his experiences and old photos from foreign countries as well. His thoughtful visits still remain in my mind as a fine memory, and it was a big help as a junior faculty. Rest in peace Dr. Miller.
Bin Lim, Ph.D.
Chair and Associate Professor, Mechanical Engineering

(l to r) Dr. Bakhtiyarov, Dr. Miller, and Dr. Zagrai at the September 2010 Mechanical Engineering department BBQ.

E lliott Paul Moore passed away May 21, 2021. He was born to humble parents who migrated in the 1930s from Oklahoma's dust bowl to California, picking fruit and following the crops. After skipping two grades in grammar and high school he was awarded, at age 15, a two-year "free ride" scholarship to the University of Chicago.

Elliott Paul Moore

Emeritus Professor,
Physics Department

Toward the end of his second year Elliott was offered a position in the laboratory of Nobel Laureate Enrico Fermi, who significantly influenced his scientific pursuits. Here Elliott became part of an extraordinary group of six young students, three of whom went on to win their own Nobel Prizes in Physics. After Fermi's death the group dissolved, and Elliott turned his focus to Astrophysics.

Some early pre-Ph.D. work included: High resolution lunar photos on glass plates with the 40-inch Yerkes refractor, separately published, which were foundational to the base maps used by U.S. astronauts in the early lunar landings, and early use of vacuum-tube computers that enabled him to publish the first complete models of the collapse of the pre-solar cloud down to our Sun.

His Ph.D. work at the University of Arizona was a spectroscopic analysis of several elliptical galaxies, fitting the spectra he took at the then-new Kitt Peak National Observatory. After graduation, he accepted a position at New Mexico Tech working with a group to build an automated telescope that would search a thousand galaxies per hour to find supernovae. With NASA collaborators he built the Joint Observatory for Cometary Research (JOCR) and was responsible for over 20 years of spectacular comet photography, analysis and publication.

In retirement he continued his experimental and theoretical work in M Theory (formerly string theory) related to astrophysical and laboratory gravitational measurements. He also guided his neighbor, Charles Millar (*editor's note: see In Memoriam – Alumni*), a Techie wanting to leave a legacy. With Elliot's encouragement, Chuck endowed a chair of Astrophysics at NMT which would be funded on his passing.

Dr. Moore was preceded in death by his wife of 38 years, Elaine Marr *(shown in photo with Moore)*. He is survived by and missed by his sister Janice Delgado, niece Sky Marchand, and Elaine's children, Philip Bernick, Amy Sheridan, Margaret Stephenson and Andrew Bernick.

The family asks that you honor Elliott's memory and thoughtfully donate time or money to whatever progressive cause you deem worthy.

New Mexico Tech Physics Department

Gilbert Sanchez

*Biology Department,
1968 - 1979*

Gilbert Sanchez passed away March 11, 2021. He was born in 1938 and attended New Mexico State University, where he received a bachelor's degree in microbiology. After working at New Mexico Tech, was selected as Dean of College of Arts and Sciences at Eastern New Mexico University.

From 1980 - 1985, he served as Vice President for the University of Southern Colorado in Pueblo, CO, then in 1985 he was elected President at Highland University in Las Vegas, NM, where he served for ten years.

He married Lorena Tabet in 1961, and they had three children, Elizabeth Sanchez, Dr. Phillip Sanchez (Teresa), and Katherine Irons (Tanner).

An alum remembers Dr. Sanchez:

I am a 1975 Biology graduate of New Mexico Tech. I journeyed to NMT from Los Angeles, CA in search of a new experience, quietness, and to reset my goals of becoming a doctor. At that time, there were many barriers for Latino students to succeed in professional pursuits. One major impediment for someone like me was the lack of witnessing another person that looked like me, who was successful and a leader in his profession.

Meeting Dr. Gilbert Sanchez at NMT was a pivotal moment in my life, when I was most in need of a positive mentor. He was born in Belen, NM and was a Biology professor and department chair. When I arrived, I received a work study assignment to the laboratory of Dr. Sanchez. I did not know then how I was selected; later I learned that he searched for Latino students like himself.

At the time, I did not realize or understand what this placement would mean to me. Throughout my education I had never had a Latino teacher, professor, or advisor until I worked for Dr. Sanchez. Here was someone who was ethnically and culturally like me who was the department chair of Biology. He selected me to start cleaning rat cages and then move up into his Microbiology Lab and help him with his research.

As I worked and studied, it was not easy for me to matriculate from NM Tech, graduating with a B.S. in Biology with Honors. I never remember Dr. Sanchez offering direct encouragement, but he did instill in me a belief that I still carry today: If someone believes in you, then you have a better chance to succeed and pass it on to others. I give credit to Dr. Sanchez for helping me achieve my goal to become a medical doctor, now completing 35 years as a Board Certified Psychiatrist in New Mexico.

I will truly miss Dr. Sanchez and I extend my heartfelt sympathy to his family on his passing in March, 2021. He went on to excel as Dean, Vice President, and President of several universities. He was a very proud Latino who achieved many things but never forgot to help others, like me, along the way.

Ernest A. Flores, M.D. (B.S. Biology, 1975)

Henry "Mo" Morris Eiland

B.S. Chemistry, 1953

Henry Morris Eiland passed after a brief illness on January 1, 2020, at the age of 91. Morris and his identical twin, John Edward, were born to Roby J. Eiland, and Lillie Paddock Eiland on June 23, 1928 in Socorro, NM, where his parents were homesteaders. He grew up part of a ranching family, then enlisted and served in the Army during World War II.

He married his high school sweetheart, Edith McConnelee Eiland, in 1949, and took advantage of the GI Bill to continue his education, earning his B.S. from the New Mexico School of Mines, followed by his Ph.D. in Chemistry from New Mexico State University in 1957. Morris spent his career working in nuclear physics at Knolls Atomic Power Laboratory, where, along with basic radio chemistry research, he helped support the US Navy nuclear fleet.

Along with raising three lively children with his wife, Morris was also very active in Rotary, was a board member of the Charlton Girl's School, and participated in local musical and theatrical pursuits while living in the area. He and Edith spent their early retirement years travelling from their new home base in Las Vegas, NM, where Morris continued to be active in Rotary, and also became involved with the Santa Fe Trail Association.

They moved to Schenectady, NY, in 2007 to be closer to family. Edith predeceased Morris in 2009, and he found the second love of his life, Gilberte Brown, with whom he spent 5½ happy years until her unexpected death in 2015. Morris was predeceased by his sister, Patsy Ellen McPherson, his wife, Edith, and one son, John Preston Eiland.

He is survived by his twin, John Edward Eiland (Doris), a brother-in-law, Lt Col James McPherson Ret, three children, Edward Earl Eiland (Deneisha), Margaret Eiland Black (Stephen), and Alice Kathleen Crilly (Paul), as well as six beloved grandchildren and seven great-grandchildren.

Since Morris was extremely fond of children, the family is asking that any donations be made to St. Jude's Hospital for Children.

Charles "Chuck" A. Millar

Mining Engineering

Charles "Chuck" Millar came to Socorro from New York in the early 1960's to study Mining Engineering. He was drawn to New Mexico Tech because of its excellent reputation in mining and its absence of sports and fraternities, which in his mind took away from academics. Like many, Chuck spent his time at Tech studying and mineral hunting with friends.

Unfortunately, after rumors spread that Dr. E.J. Workman would halt engineering instruction in favor of a focus on the pure sciences, Chuck left NMT. The rumored change did not materialize.

Despite his short time at NMT the university and community of Socorro found a permanent place in Chuck's heart. After a career in mining and construction, he and his wife Helen Brasfield made Socorro their home. Chuck and Helen were founding members of the First Unitarian-Universalist Church in Socorro.

Known to read textbooks for leisure, Chuck was a lifelong learner with a naturally curious nature.

He was particularly interested in astrophysics - so much so that in 2008 he established two endowment funds at New Mexico Tech to support astrophysics research. The **Charles A. Millar Astrophysics Professorship Fund** provides salary support for a NMT faculty member studying an area of astrophysics. The **Charles A. Millar Graduate Scholarship in Physics** provides financial assistance to a high achieving astrophysics graduate student.

Chuck was an incredible supporter and longtime friend of New Mexico Tech and will be greatly missed.

Robert "Bob" Pawlowski, Jr.

B.S. Geophysics, 1983

Robert (Bob) Pawlowski, Jr. passed away June 28, 2021 after a hard fought battle with cancer.

After earning his B.S. from New Mexico Tech, Bob received an M.S. from Colorado School of Mines in 1987. He then worked with ARCO in Alaska, then with geophysical vendors in Houston.

He joined the Chevron GEMS team in 2006, and later became its Team Leader prior to moving to Indonesia for a while to work as Geophysical Advisor in Chevron's Geothermal business. Before his retirement, he was a critical member of the Basin Framework team.

Active in the external potential fields community, Bob was a brilliant scientist who leaves behind a strong legacy. He was instrumental in Chevron's successful planning and execution of one of the world's largest commercial airborne gravity and magnetics surveys in the Partitioned Zone.

He was respected by colleagues, known for his thoughtful and thorough approach and legendary documentation. He is remembered as a good friend, inclusive worker, early coffee maker with a wry sense of humor and endless collection of printed shirts.

Bob is survived by his wife Regina, son Justin, brother Vincent, and parents Robert and Margaret.

Bob's family has set up the **Robert Pawlowski, Jr. Memorial Scholarship** for NMT students with an interest in geophysics. To make a tribute gift to this fund, go to https://advancement.nmt.edu/tribute and select it from the dropdown menu.

Darlene Raicevich

B.S. Chemistry, 1967

Richard Rising

B.S. Geololgy, 1957
B.S. Petroleum Engineering, 1959

It is with sadness that I inform you that my parents (two of your alumni) have passed away. Most recently my mother, *Darlene Raicevich,* passed away on February 21, 2021. My father, *Richard Rising*, passed away in 2003. Both had successful careers, albeit through different paths.

My father went directly into the oil industry and progressed through professional and managerial positions, ultimately retiring with Mobil Oil Company.

My mother married and raised two sons until 1972 when my parents divorced. She took her skillset, learned at NMT, and for the next 30+ years taught scores of young adults math, chemistry and physics at the senior high school and college levels.

If you read my mother's invitation to join the American Chemical Society *(Ed. note - on display at the NMT Advancement offices)*, it was written for a man only. My mother was proud of her accomplishment. She always wondered what her life would have been if she had gone straight into a career.

My parents often spoke of their time at New Mexico Tech: the things they learned, the people they met and the activities they participated in. They both strove for excellence and had a strong desire for continued education. This rubbed off on me as I went on to study geophysics in university and had an exciting career in the petroleum industry.

New Mexico Tech was a major part of my parent's lives, and their lives are part of New Mexico Tech's history and legacy.

Glenn Rising

Damian Banks is a senior who will graduate in December 2021. He started as a computer science and mechanical engineering major, but his plans have changed. Now, after graduation, he hopes to become NMT eSports Director in the Physical Recreation department. He's also the first New Mexico Tech Foundation Board student trustee.

The NMT eSports student club was started in 2018, when President Wells and Dean of Students Dr. Peter Phaiah held a campus meeting to gauge student interest in eSports at New Mexico Tech. They expected perhaps a dozen students, but almost 100 attended to express their support. At the end of the meeting, Damian approached President Wells and Dr. Phaiah to volunteer to organize the sports club. He created a plan, working with students, administration, staff, and alumni, and the eSports club was launched. At the first meeting, attendees voted Damian in as club president.

Currently there are 200+ members of the club, and there have been as many as three concurrent competitive teams: Rocket League (3 on 3 players), League of Legends (LoL, 5 on 5), and Overwatch (6 on 6, recently dormant). Competition for the teams is increasing - they've had up to 30 students vying for one of six spots.

All the varsity teams have had at least one female player every semester (except LoL in Spring 2021). The club voted to require competitive players maintain a minimum 2.5 GPA; all NMT players have maintained their eligibility while on the teams.

The club now has a permanent home in the Gold Building created by restructuring two rooms, with gaming setups *(photos at right and below)*. Competitive players, club members, and local high school and charter students (throughf the club's outreach work) all make use of the facilities.

Recruiting and outreach are now Damian's focus. His dream is to create *eSports* scholarships for incoming NMT students, to have them bring their competitive

Focus and determination

The eSports club home in Gold Building is popular

energy to their studies. He notes that students can earn a degree anywhere - eSports offers a reason to persist in the rigorous NMT academic environment.

Damian believes the biggest factor in the success of NMT eSports is the support of the administration, staff, and alumni. They made it possible to grow the program from a fledgling student club to a thriving competitive league, active community outreach program, and potential recruiting tool.

The future of eSports at New Mexico Tech could be in good hands.

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