

Dr. Michaelann Tartis

A word from the president . . .



Greetings New Mexico Tech alumni,

As we kick-off the spring 2018 semester and my 18th month as President of this outstanding university, I am pleased to highlight some of our key accomplishments here at Tech. One of my primary approaches is to create what I call a “sticky campus” – a place where students, employees, and local residents enjoy visiting.

While the Loma Theater is not on campus, we re-opened the theater, with help from partners at the City of Socorro, First State Bank, and the new manager, Elmo Baca of Las Vegas, New Mexico. We hosted a street party for the official grand opening, and I am hearing overwhelmingly positive feedback from NMT students, faculty, and staff about having first-run movies available in 3D in Socorro. I have also heard gracious comments from Socorroans who are grateful to have another entertainment option in town.

Another critical milestone was the completion and dedication of the Daniel H. Lopez Chemistry Building. We hosted a grand opening in September that saw the lobby brimming with local dignitaries, faculty, students and visitors. We have also started construction of the new state-of-the-art building that will serve as our new data center and consolidate all the servers on campus. Another key goal was the securing of funding to renovate Jones Hall, which will take place over the next two years.

Depending upon the support from New Mexico’s citizens, our next capital improvement project will be

the renovation of Brown Hall, which serves not only as NMT’s main administration building but also as the site for many student and faculty services and support. Brown Hall was built in 1929, is on the Historical Register, and is truly showing its age.

As part of the “sticky campus” endeavor, a very large capital project is on the horizon. It is our plan to initiate a capital campaign in order to construct a state-of-the-art wellness center, which we are calling the Body and Mind Center. Given the significant relationship between a healthy body and mind, we believe this facility will be instrumental in supporting students as well as the broader Socorro community in both aspects. Our conceptual design of this facility’s physical recreation amenities includes an indoor Olympic-sized pool, gymnasiums, weight rooms, a climbing wall, a track and much more. The “Mind” part of this building will include classrooms and laboratories that focus on Tech’s growing transdisciplinary endeavors in biomedical engineering and research. It is our hope that academic portions of the building will be eligible for state funding, with the remainder of the building requiring support from student fees, the City of Socorro, and most importantly from philanthropic donations. Given the importance to our Tech student body and Socorro community, I hope that you, our alumni, will consider extending your generosity to your alma mater when the time comes for us to solicit donations for this worthwhile endeavor.

New Mexico Tech’s community of faculty, students and staff have set a vision and plan for the next decade, Blueprint 2027, that will make NMT a vibrant, rural STE²M university in a growing and thriving community of Socorro; a vision for our university that is not only based in science, engineering and technology, but also entrepreneurialism, or STE²M. We look forward to sharing our vision and planning over the next year, and soliciting your input to support Tech’s great evolutionary trajectory.

Sincerely,

A handwritten signature in black ink, appearing to read "Stephen G. Wells". The signature is fluid and cursive, written over a white background.

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 FACULTY SPOTLIGHT Dr. Michaelann Tartis

06 TECH RESEARCH Argon Geochronology Lab

12 STUDENT RESEARCH Membrane Research Group

16 PRESIDENT'S CLUB Garden Party

17 FOUNDERS'S CLUB Founder's Club Celebration

20 PEOPLE YOU KNOW

22 IN MEMORIAM

27 THE LAST WORD Benjamin Katko

FEATURES

10 CONSTRUCTION UPDATE

14 FROM the PRESIDENT of NMTAA

15 ARCHIVE CHALLENGE

18 49ERS



49ers Parade 2017

<http://www.nmt.edu> o 1.800.428.TECH (8324)

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

faculty spotlight

dr. michaelann tartis

dr. michaelann
(shortencarrier) tartis

Dr. Michaelann Tartis is a Chemical Engineering professor and also an NMT alumna, receiving her B.S. in ChE in 2002. In 2002, she went to UC Davis to pursue her Ph.D. in Biomedical Engineering.

One could say NMT is in her family blood because several of her family members also graduated from NMT. Her father received his B.S. and M.S. in Math; her mother got her B.S. in Biology; her stepmother worked at the Bureau of Geology, and her stepfather earned a B.S. in Geological Engineering. Furthermore, her uncle received a B.S. in Chemistry; a cousin, a B.S. in Math; two stepbrothers, one a B.S. in Math, and the other transferred out of NMT. One of her stepbrothers married the daughter of Dr. Reid Grigg, a retired researcher from the Petroleum Recovery Research Center.

Michaelann was a student



NMT Biomedical Engineering Society (BMES) Student Chapter from 1998 to 2002. She was an RA in South Hall and comments that the stories she has from her time as a student are meant “to be told in person.” During her academics, Dr. Don Weinkauff was the Chemical Engineering Department Chair. There were approximately 13 students in her graduating class; seven were women. Under Weinkauff, she was involved with research to build a fuel cell to test different membranes. The research project was in collaboration with Sandia National Laboratory and the research group visited Sandia’s facility to learn and design a test cell. What she recalls about the

project was, “We needed to figure out how to do it. It was a good feeling.”

Michaelann also worked with Dr. Robert Holson in Psychology on a neuro teratology study. She comments, “This is where I first realized I wanted to do biomedical research.” She met her husband, John Tartis, at NMT. He graduated with a B.S. in Chemical Engineering and an M.S. in Mechanical Engineering with a minor in explosives. They moved to California where John worked for Aerojet while Michaelann began her Ph.D. studies. They married July 9, 2005.

At UC Davis, her research focus was in drug delivery with ultrasound. After finishing at UC Davis, she returned to NMT in 2007 to begin teaching in the Chemical Engineering Department.

Dr. Tartis has been collaborating with Biology and Chemistry professors, Drs. Sally Pias and Liliya Frolova, in designing a vehicle to carry drugs to attach to anti-cancer compounds.

Her most recent research project has been consuming her time outside of the classroom. The Materials Fabrication and Characterization for Blast Induced Traumatic Brain Injury project entails collaboration between the Air Force, Michigan State University, Los Alamos National Laboratory (LANL), and Sandia National Laboratory. This new project requires fabrication to simulate brain tissues and study blast mechanisms within the brain. More specifically, the project is helping the military to determine primary shockwave



3-D printed shape as the skull model with flat clear sides to make optical imaging during the blast possible

interaction mechanisms with different tissue types to later design better protective gear for our service men and women.

What is unique about her research is the various branches of funding and collaboration required for further testing: INBRE, Sandia National Labs (with Jason Harper, NMT '02); various capstone design projects with funding

provided by LANL, (with Justine Davidson, NMT '11 and '12); department collaborations with Biology, Chemistry, and the Mechanical Engineering Capstone design team; and finally, graduate students in Materials Engineering. She employs students in Biology, Chemistry, Materials, Chemical Engineering, and Mechanical Engineering.

Currently, all of her research students are females. "It just happened," she says.

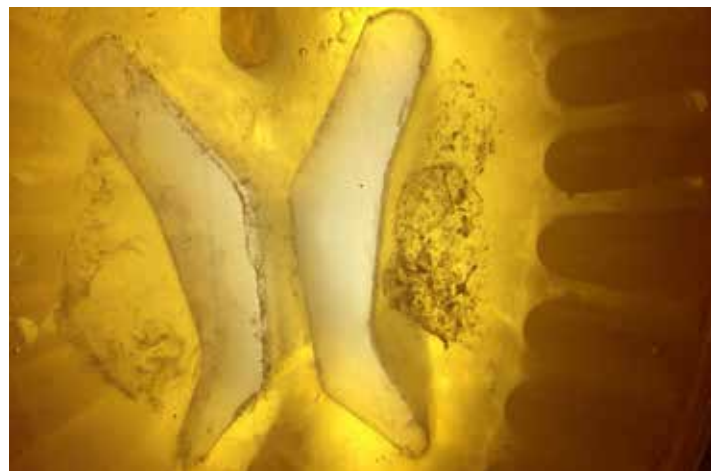
"These students approached me to help with research, and they demonstrate reliability and hard work."

She has recently become the faculty advisor for the NMT Biomedical Engineering Society (BMES) Student Chapter. Their first attendance at a BMES conference was October 2017, where a poster was presented.

Michaelann has a couple of reasons for returning after her Ph.D.: her fondness of Socorro and NMT; and she wanted to

come back to teach as a way of giving back. Her time as a student at NMT gave her opportunities that can't be found in a bigger university. "NMT is unique and rare," she adds. "NMT allows for growth, and my undergraduate research opportunities were a confidence builder. My education here prepared me for beyond." She enjoys watching her students leave NMT and explore their own fields. She's giving back by giving students opportunities to learn about various career paths, and being part of her research team expands opportunities by also giving students experience presenting their work at conferences.

infobost.nmt.edu/~chemel



Two gels representing grey and white matter that were cast to mimic anatomical structures of the brain

tech research

argon geochronology lab

New Mexico Tech is home to one of only a handful of argon geochronology labs in the world. Scientists from all over the world send rock samples to Socorro to have Bureau of Geology experts pinpoint their age using the $^{40}\text{Ar}/^{39}\text{Ar}$ radiometric dating technique.

Most people are familiar with carbon dating, which is a tried and true method for dating organic material. However, that system of dating doesn't work with rocks – and is only appropriate for samples less than 50,000 to 80,000 years old. Argon dating is effective with samples that are thousands to billions of years old.

Over the past 25-plus years, the New Mexico Geochronology Research Laboratory has built a reputation for leading-edge science among scientists from a variety of disciplines. In recent years, lab personnel have added software and hardware updates that have allowed them to also provide extremely precise dates for sedimentary rock samples.

Chuck Chapin and a group from Los Alamos National Laboratory conceived the lab in the late 1980s. Chapin, who would later become the director of the Bureau of Geology in the 1990s, cobbled together \$100,000 of Bureau funding

and LANL chipped in \$175,000 and some surplus equipment.

Dr. Bill McIntosh, who had been Chapin's graduate student, secured an NSF grant in 1991 to add new equipment. Then, Dr. Matt Heizler joined

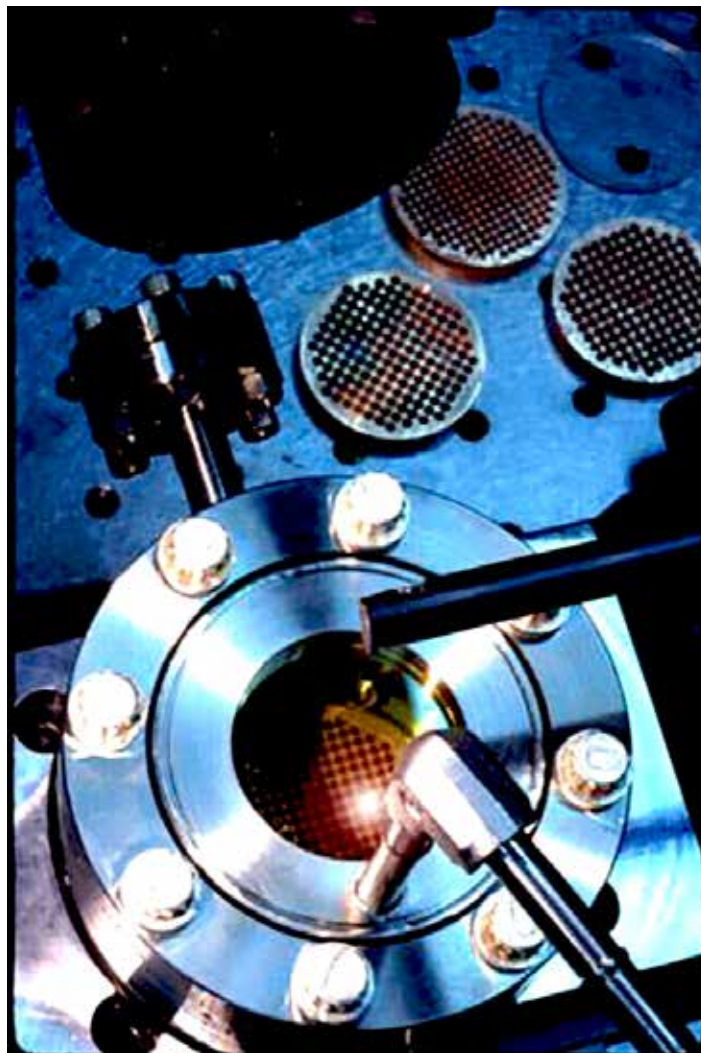
the lab in 1993.

"Once we got started, we kept adding on through grants, contracts and research, and we started new programs," Heizler said. "Bill and I had different research tracks, but we clicked."

Lisa Peters and Rich Esser joined the lab team to round out the core group.

"By 1995, all four of us were running the lab," Heizler said. "It's very unusual for an analytical lab to have as much staff as we do for argon geochronology. That makes us capable of doing what we do. We have the personnel to date every rock on the planet."

Argon geochronology is a radiometric dating technique that relies on the natural decay of Potassium-40 to Argon-40, a stable isotope. Potassium-40 has a half-life of 1.25 billion years, which means any rock sample with Potassium can be dated with some degree of accuracy, from the volcanic eruption that



CO₂ laser chamber in use by the New Mexico Geochronology Research Laboratory. Copper sample disks in background

destroyed Pompeii in 79 A.D to meteorites formed at the birth of the solar system 4.5 billion years ago. A unique aspect of $^{40}\text{Ar}/^{39}\text{Ar}$ dating is the neutron irradiation of the mineral sample. The irradiation is preformed at a research-grade nuclear reactor and is used to convert some of the samples Potassium-39 to Argon-39. In the laboratory the sample is heated to release the argon and the isotopes of Argon-39 and Argon-40 are measured using a noble gas mass spectrometer. By measuring the ratio of Argon-39 to Argon-40, scientists can determine the age of the sample.

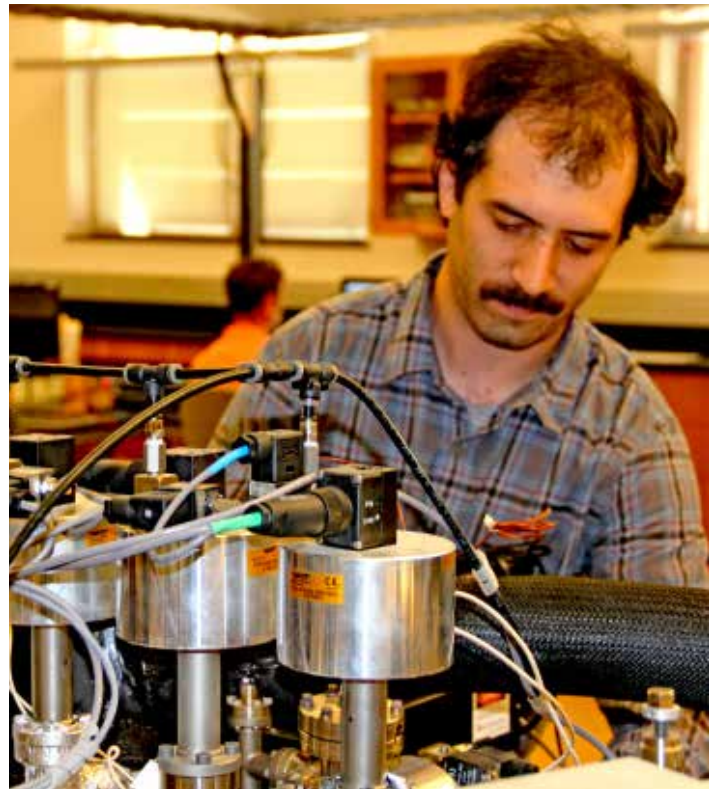
At about one percent of the atmosphere, argon is the most abundant element in the atmosphere after nitrogen and oxygen. Therefore, every material exposed to the atmosphere will contain some quantity of argon that is considered a “contamination”. Argon geochronologists overcome this problem by performing their experiments in Ultra-High-Vacuum chambers.

These UHV chambers essentially have no atmosphere in them; the air pressure in the chamber is about 10 billionths of the air pressure at the surface of the earth or equivalent to the air pressure in outer space.

Argon geochronology labs are rare. Less than 25 exist worldwide. Many of them do not take outside work. New Mexico is the only state geological survey to host an argon lab.

“People came to us for two reasons – a good product and timely results,” Heizler said. “That’s why we became so popular and still are. Bill, Lisa and I have been here for over 20 years and that’s what has made this lab what it is.”

The 2000s saw significant upgrades in technology. The lab received \$1.3 million of major research instrumentation funding in 2007, which funded two ARGUS 6 mass spectrometers from Thermo Fisher Scientific. The lab staff then partnered with Thermo to develop a new generation



Dr. Jake Ross in Tech’s Argon Geochronology Lab of instruments.

“They were reluctant to sell non-standard instruments, but we wanted certain aspects,” Heizler said. “They went out on a limb and developed prototype electronics. They did the R&D and we did the beta testing, and we developed unique things. That’s been our philosophy from the get-go, always pushing technology. It costs money of course, but ultimately it was the right path and kept us state-of-the-art.”

The Argon Lab saw another round of upgrades in 2015 when the Bureau and then-president Dr. Daniel H. López both offered seed money for new instrumentation.

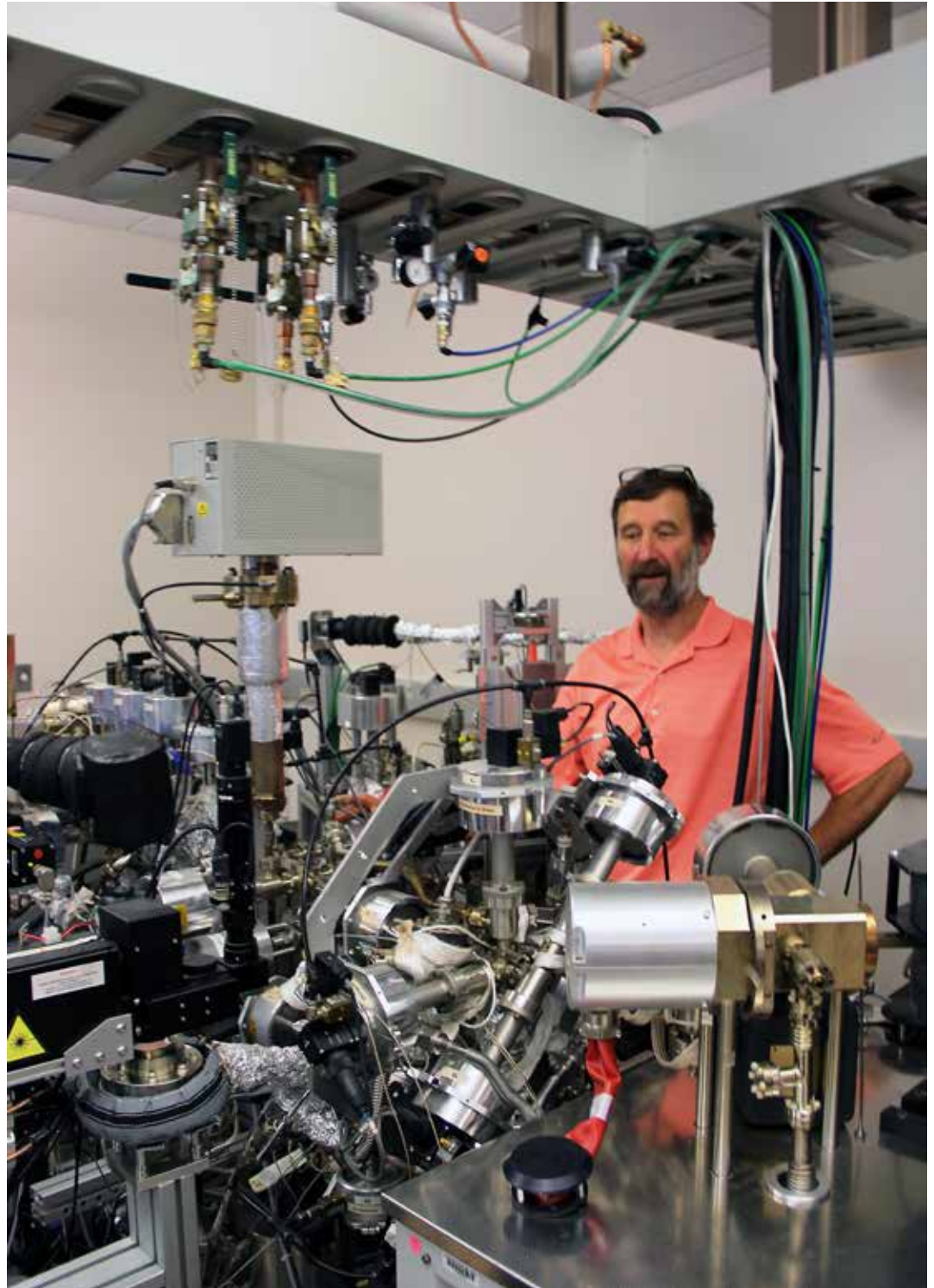
“Bottom line – President López was very supportive over the years,” Heizler said. “When we needed money to upgrade, he always said, ‘Yes’. ... for a reason, of course. We paid it back with research grants over and over and over. So,

it's been a good synergy.”

In addition to securing the latest-greatest spectrometers, the Argon Lab has also made monumental leaps forward in software. Dr. Jake Ross joined the lab informally about 10 years ago and recently became a staff scientist. Ross came to New Mexico Tech as a master's student from McGill University in Montreal. He earned his master's and Ph.D. in Earth Science at Tech, followed by a post-doc at the Bureau.

“Jake is an integral part of the state-of-the-art program development,” Heizler said. “He is really seeing opportunity and seizing it and doing something spectacular. He's taking a whole different approach to software development and interfacing equipment. He's providing the backbone to proceed as a community software.”

Ross has been developing a new software application that he has dubbed Pychron. Ross visited the Thermo Scientific factory



Matt Heizler in the NMGRL

in Germany where he presented his software platform two years ago. Now, he is presenting his software at a global conference in Socorro in early June. More than 35 scientists from around the world are attending the three-day workshop on geochronology. Ross, Heizler, and McIntosh are the organizers and featured presenters. The Argon Lab team will be sharing their breakthroughs with the global geochronology community.

“There’s been some pushback from peers who don’t have our instrumentation,” Heizler said. “When someone gets a new instrument like ours, people are saying, ‘Holy cow, is that really a 5,000 year error on a 28 million year old rock?’ Yes. People say our low error doesn’t factor in all the uncertainties, but we don’t think so. We’re not missing anything.”

Ross said the combination of the latest mass spectrometer technology and the new software interface allows him – and

all geochronologists – to filter out trace data.

“We’re looking for a ratio of Argon-40 to Argon-39,” Ross said. “We’re only interested in the argon, but there’s other things – a lot of other stuff that we don’t want in the mass spec.”

The Pychron application provides such clear results that analysts can identify and rule out anomalous elements. That development makes the argon chronology dating technique at the Bureau 10 to 100 times more precise than previously.

“The new data is incredible. Our precision has increased by an order of magnitude,” Ross said. “We use the term ‘higher-resolving power.’ We used to see one peak [from the mass spectrometer], but now we can see that the big peak is composed of separate peaks and we can separate out other interferences. Modern electronics and modern engineering!”

Argon geochronology is more than just an esoteric pursuit. The technique

has a variety of practical applications. Ross said the concept of dating starts with the motto “No Dates, No Rates.”

“In geology, we really care about the rates at which things are happening,” Ross said. “Like climate change – we can measure that climate is getting warmer, but we don’t know if it’s caused by humans. One way to get at that is by how fast things changed in the past. We can assume from current measurements that climate has never changed as fast as now. So, it’s got to be humans.”

The method can be used to shed light on plate tectonics and volcanism. The petroleum industry and mining industries are also interested in dating mineral deposits.

“Geochronology has always been a part of economic geology,” Heizler said. “Hard rock mining – copper and gold– are the big ones. We track industry trends at some level. When commodities are high, companies

put more time and money into research and supporting our students. We’ve relied heavily on contract work to fund students, development and technicians.”

Roughly one-third of the lab’s income has come from private industry over the years. That is consistent with the lab’s research mission to divide the time into thirds – between New Mexico, the Southwest, and elsewhere.

Heizler and McIntosh have each supported more than 30 graduate students over the years with Argon Lab funding. They’ve also employed dozens of undergraduates to run the lab. Lisa Peters has a consistent track record of finding sophomores who can work in the lab for two to three years.

“We’ve impacted a tremendous number of undergraduates,” Heizler said. “We need them and they need us.”

<https://geoinfo.nmt.edu/labs/argon/>

construction update

body & mind center and more

construction project talking points

With the opening of the new Daniel H. López Chemistry Building, New Mexico Tech's current construction efforts are focused on two renovation projects and an ongoing new construction.

However, the largest priority is a new wellness center.

The Body and Mind Center would be partially funded via the 2020 General Obligation election. Still in the early planning stages, a campus committee is determining how this building will best serve the campus community.

The Body and Mind Center will include most of the features of the existing gym, such as

basketball courts, weight rooms, rock climbing wall, locker rooms, and racquetball and squash courts. The building will also have an Olympic-sized indoor swimming pool and an indoor track.

The "mind" part of the Body and Mind Center will include classrooms, labs, conference rooms, and other multipurpose 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.

The City of Socorro has pledged financial support for this project. Tech will also launch a capital campaign to raise funds for recreational portions of the building, which are not eligible for public funding. For more details, see President Wells' letter in this issue.



construction update
body & mind center and more



Data Center, to be completed in early 2018

Earlier this year, NMT selected Jaynes Construction of Albuquerque to build a new data center, which will be completed in early 2018. The new building will be 2,600 square feet and cost around \$2.7 million. This purpose-built server facility will conserve utilities and allow the Information Technology and Communications Department to be more efficient in maintaining computer and internet service to campus. Initially all the existing data center servers will be moved into the new facility. Over time, the goal is to move other campus servers into the

new building.

The university secured \$5.5 million from the 2016 General Obligation bond to completely remodel Jones Hall. The complete budget is \$9 million. This dated building is in dire need of renovation. The project will cover a new roof, new HVAC system, laboratory upgrades, energy efficient windows, and energy efficient exterior.

The second floor, which was vacated by the Chemistry Department, will be completed first and only take a few months. The Chemical Engineering

Department will move into the second floor. Once the second floor is completed, the first floor will be renovated over the following year.

Funding for Brown Hall will be on the ballot during the general election of 2018. Voters will decide on NMT's

request for \$7.2 million for a complete renovation, including HVAC, lighting, information technology, electrical, plumbing, basement work, and some paving. If the G.O. Bond passes, Tech would start this project in spring 2019 and conclude within eight months.



student research

membrane research group

student research: membrane research group

The Membrane Research Group is under the direction of Dr. Frank Huang, Professor in Environmental Engineering. The ten students on the team come from different disciplines, which has helped make the project successful. The students are:

- o Lynda Laumbach, MS in Environmental Engineering (BS in ENVE)
- o Riley Reprogle, MS in Materials Engineering (BS in MATE)
- o Carolyn Medin, MS in Environmental Engineering (BS in Biology)
- o Julian Paiz, MS in Environmental Engineering (BS in Biochemistry at UNM)
- o Maria Troyer, MS in Environmental Engineering (BS in Chemical Engineering)
- o Cheyenne Rivera, MS in Environmental Engineering (BS in Chemical Engineering)



Membrane Research Team, including: Casper Huang, Hansen Dube, Julian Paiz, Riley Reprogle, Lynda Laumbach, Carolyn Medin, Allie Arning, Cheyenne Rivera, Maria Troyer, Vanessa Ward

- o Allie Arning, 5-year BS/MS in Environmental Engineering
- o Vanessa Ward, BS in Environmental Engineering
- o Hansen Dube, BS in Chemistry
- o Casper Huang, BS in Mechanical Engineering

The project is in its fifth and final year, ending May 2018. Funded by the National Science Foundation through the New Mexico EPSCoR program, the main goal of the project is to establish R&D capability for membrane

fabrication, characterization, and applications in water desalination and power generation.

According to Dr. Huang, the current focus is to fabricate microporous (an average pore size is 0.3 microns) hollow fiber membranes for the desalination of geothermal brackish groundwater using direct contact membrane distillation (DCMD). DCMD is a process by which a thin, microporous, hydrophobic polymer membrane separates two streams of a liquid. A temperature gradient is applied across

the membrane and the vapor pressure differential drives the vapor phase fluid from the hot side to the cold side.

A pilot-scale system was designed, constructed, and deployed to the Masson Greenhouse (the second largest geothermally heated, commercial greenhouse in the U.S.) at Radium Springs, NM, for field testing. The intent is to desalinate the geothermal brackish groundwater, currently used for space heating, to be used for crop irrigation.

At the onset of the project, raw materials were fabricated (not purchased) to create the membranes. Smaller scale tests were conducted in the lab before the larger materials were moved to the test site in Radium Springs.

The student members present shared their insights about the multi-disciplinary necessities to function as a team:

Hansen Dube, from California, is one of three undergraduates on the team. As a sophomore, he says he “likes the diversity of skills” he has to use and

understands the amount of depth in engineering that is needed.

Carolyn Medin, from NM, received her BS in Biology at NMT and mentioned an “overlap from Chemistry and Biology.”

Maria Troyer, both from NM, spoke about their Chemical Engineering background. They both commented about the overlap between their previous and current disciplines and about

an engineer and visited NMT before transferring. Being on the project, he also notices an overlap between Biochemistry and Environmental Engineering, saying he likes “the direct connect to industry and the real world, and the different approaches” required. “Prep is key,” he continues, when asked about time out in the field. “Having access to materials in the lab reduces wasted time”

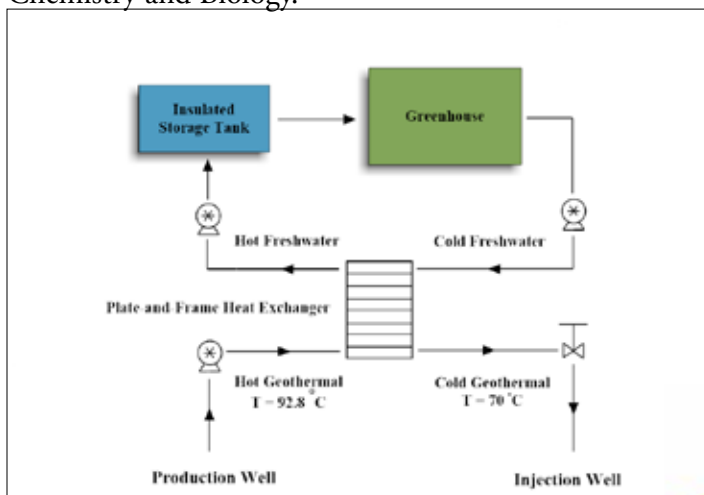
Several students have spent time in the field. Allie Arning, from

with understanding. “In the field you might have to repair or troubleshoot something. You have to think quickly.”

The team has presented their research around the U.S., including Boston, MA, Missoula, MT, at an EPSCoR conference, and at NMT. They plan to present at the 2018 Student Research Symposium.

When asked about their contributions, the students agreed that educational training was at the frontline. What they all enjoy the most about working on the project is that it’s a two-way learning process. They are cognizant of their peers’ work, enjoy sharing ideas even if it’s outside of their discipline, and would love nothing more than having a lounge in the department where they can gather and speak about more ideas amongst the team and other students. Dr. Huang concluded, “The project is not confined; it is truly integrated.”

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



Simple Pilot-Plant Process Flow Diagram

She says the project is “different [because she] learn[ed] how to fabricate the membrane.”

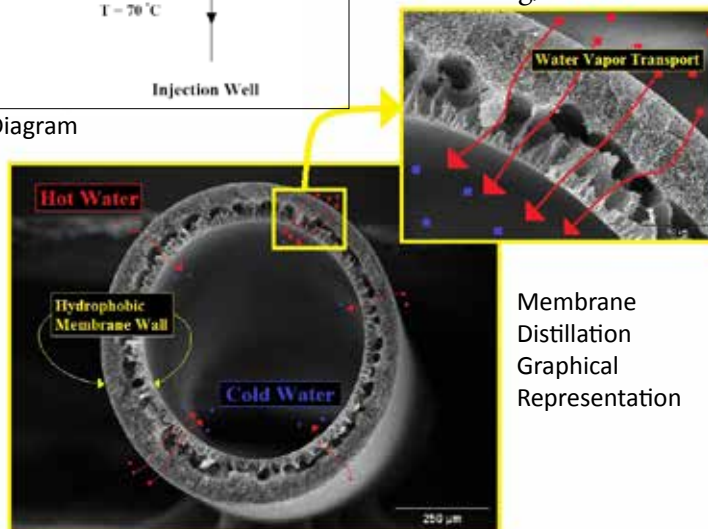
Riley Repragle, from Indiana, spoke about his contribution in developing the material for the membrane fabrication, claiming his Materials Engineering degree gave him exposure to polymer characterization. Polymers are used as a barrier in the fiber membrane to separate salt from the water.

Cheyenne Rivera and

being able to get a “bigger picture of processes, understanding regulations in the control process.”

Julian Paiz, from Utah, was studying Biochemistry at UNM when he wanted a fresh start as

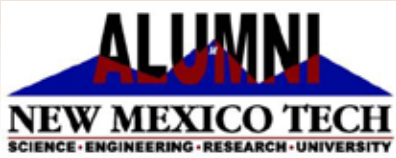
Albuquerque, speaks about her experience in the field. “There are controls in the lab. In the field, there are challenges, and things that you don’t expect.” Most of her peers nodded



Membrane Distillation Graphical Representation

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?



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!

WHAT?

WHERE?

president's club

president's garden party

As most of you know, donations to higher education institutions are playing an ever increasing role of importance in the day-to-day functions at most universities.

to higher education, in an effort to keep tuition affordable for Tech students, and to continue to attract and retain world-renowned researchers, President



Mike Stanley, Rep. Gail Armstrong and Art Colgate



Lillian Armijo, Beth Wells and Dr. Stephen Wells

The same is true at New Mexico Tech. With the State of New Mexico cutting the appropriations

Wells is focusing on the New Mexico Tech Foundation and the Office for Advancement to raise even greater numbers

from our alumni and other constituents. Records indicate that Tech alumni are consistently donating in greater numbers every year.

To honor alumni and donors of New Mexico Tech, there has long been the President's Club. This club was established by President López to honor every person who donated \$1,000 to NMT in the previous calendar year.

This year the President's



Club Dinner morphed in to the President's Garden Party. The event was well attended and took place in June of 2017 in the garden area just north of Workman.



founder's club

founder's club celebration

President Wells has created a new club—the Founder's Club—in honor of the folks who give the largest donations to New Mexico Tech.

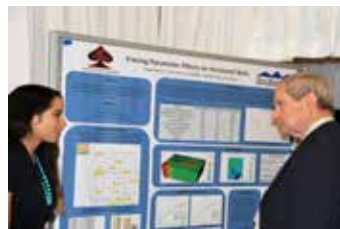
The inaugural Founder's Club event took place in the gym at New Mexico Tech on Saturday, November 4. Donors who donated \$10,000 or more in the previous calendar year (2016) or \$50,000 in cumulative life-time giving were invited to attend this exciting event.



Dr. Wells presenting the President's Medal to Dr. Frank Etscorn

President Wells also unveiled and awarded the most prestigious award to be given at NMT, the President's Medal, to former professor and researcher, Dr. Frank Etscorn. Etscorn was acknowledged for his contributions to science

(the invention of the Nicotine patch) and for what Tech has been able to do with its proceeds from this remarkable invention---\$14 M given in scholarships since 1995, which assisted 3572 students since 2000.



Students were on hand to explain their research projects. Laura Lopez presented her fracing findings to Dr. Cleve McDaniel

All donations are taken into consideration when placing donors into their respective clubs. The President's Club Party will be April 28, 2018 and Founder's Club



Connie Robnett, Art Colgate, Frank and Sheri Etscorn, Van Romero, Holm Bursum, Jerry Armijo, Mike Kelly



Dr. Stephen Wells, Founder's Club Celebration, 2017

Celebration will be August 25th. Watch the mail for your save-the-date reminders!

A very special thank you to all of you who donate to our fine, unique institution! You DO make a difference. If you would like to donate you can reach out to Colleen Foster at colleen.foster@nmt.edu or at 575-835-5352.



Magician Kayla Drescher entertaining guests at the Founder's Club Celebration

You can also donate on line at <https://advancement.nmt.edu/donate.situations>.

49ers



2017



people you know



Jeremy Epstein (B.S. CS 1980) recently returned to the National Science Foundation as deputy director for the Division of Computer and Network Systems, where he leads NSF's funding of research in computer science areas including security, privacy, internet of things, cloud computing, cyber physical systems, networking, undergraduate education, high school education, and technology transition (I-Corps and I/UCRC).

His youngest child recently enrolled in a small college in Pennsylvania, endorsing the old Tech slogan "small colleges need love too". His middle child is about to finish his Ph.D. in computer science at University of Washington (Seattle), and his oldest is a

school counselor in St Louis Missouri.

Perhaps most importantly, he is enjoying the 40 pounds of green chiles purchased through the NMSU alumni program in the Washington DC area.



Bruce Frederick, an assistant Santa Fe County attorney was promoted to the top post in the county attorney's office. Frederick, originally from Santa Anna Heights, California, moved to New Mexico in 1985 to study groundwater hydrology at New Mexico Tech, where he received a master's degree.

He remediated groundwater contamination sites with the New Mexico Environmental

Improvement Division, according to a county news release, and has also worked in private practice as well as with the nonprofit New Mexico Environmental Law Center. Frederick received his law degree from the University of New Mexico in 1993. His office provides legal counsel to county officials and the county manager.



Jonathan David Gardner, B.S. Management '08, was promoted to the major crime division in the 2nd Judicial District of New Mexico. Jonathan has been an Assistant District Attorney since 2016.

Tom Jones (1992, B.S. Physics & B.S. Basic Sciences) is Program Manager at the University

of Maryland Center for Advanced Transportation Technology Laboratory in College Park for the past 2 years. He previously worked for the City of Baltimore and the Internal Revenue Service, and has an MBA from Loyola University, Maryland.

Tom lives with his wife Johanna in Greenbelt, Maryland. In August, they went on an Idaho astronomer-equipped week-long Idaho whitewater rafting trip that concluded with the solar eclipse. Tom is webmaster for the Baltimore Kinetic Sculpture Race, www.kineticbaltimore.com and leads the official photography team.

You're welcome to contact Tom if you have solid Java, Python, Hadoop, or other big data experience and are interested in working in transportation visualization in Maryland. Tom Jones: 202.285.0804, cell.

David C. McMIndes of Kansas City, Mo., was inducted into the Missouri S&T *Academy of*

Mechanical and Aerospace Engineers on October 13, 2016. 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 the 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 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.

Patrick Radabaugh, PE, has been promoted to senior associate in Dewberry, a privately held professional services firm, in the Denver, Colorado,

office.



Radabaugh is a project manager with more than 14 years of service at Dewberry. His experience includes flow and load projections, chemical and biological process modeling, secondary clarifier modeling, plant hydraulics, phosphorus removal, pumping systems, regulatory reviews, and cost estimating. He has performed process evaluations at multiple treatment facilities.

After earning his bachelor's degree in Environmental Engineering from New Mexico Institute of Mining and Technology, Radabaugh went on to earn his master's degree in Environmental

Engineering from Michigan State University. He is a member of the Water Environment Federation and a licensed engineer in Colorado.



Michael Wine (Ph.D., Hydrology) receives Fulbright post-doctoral fellowship.

Over the years as a student in the NMT hydrology program—six to be exact—I have watched many hydro students graduate and move on to leading consulting firms, top academic institutions, and prestigious fellowships.

As my time as a grad student drew to a close I applied to a few different opportunities including

a Fulbright post-doctoral fellowship in Israel. I knew from the beginning that a Fulbright would be a long shot—only about one in ten applications are successful—but I gave it a try. I spent about three weeks working to craft a high-quality application and research plan. With unspecified contributions of hard work and good luck, I was awarded a 20 month post-doc for the proposal entitled: *Impacts of increasing temperatures on ecohydrology along a gradient of elevation in the Jordan River headwaters.*

I recently attended orientation and was humbled to find myself in a cohort that included fellow grantees from Harvard, U. Penn, Princeton, Brown, and Dartmouth. I look forward to applying the numerical and mathematical modeling, hydrogeochemistry, and geophysics skills I've learned at NMT to better understanding climate change impacts on the Jordan River headwaters in particular and karst systems more generally.

in memoriam

Terry Robin Asher, '76

Terry Robin Asher, 62, passed away after a short illness on August 2, 2016. He was born on January 11, 1954 in Fort Leavenworth, KS. and moved to Albuquerque in 1958. He graduated from Manzano High School in 1971, and earned his B.S. in Microbiology at New Mexico Tech in Socorro.



Growing up during the space race, Terry developed a strong interest in and appreciation for math and science. He passed on this enthusiasm to the people around him, especially students. Terry worked as a particle accelerator operator at Fermi National Accelerator Laboratory (Fermilab) for over 25 years. He spent much of his time learning about high-energy particle physics from world-renowned

experimenters and wrote an operational manual for the massive machine. He also volunteered at the Field Museum in Chicago as a docent. Terry's other interests included geology, astronomy, photography, and music. He never lost his sense of wonder or passion for learning, taking classes at Santa Fe Community College after his retirement. He is preceded in death by his mother, Joetha Asher. He is survived by his father, Arlen Asher; his brother, Kelly and wife Donna; and his nieces, Melissa and Kathleen.

John Balulis Jr., '06

(51) passed away in November 2016, in Albuquerque, NM. John was an avid board game player, loving husband, and a contented stay-at-home dad to his beloved daughters, Jennifer and Angela. After growing up in Manassas, Virginia, he came to NMT in the late 90's. Because he found so many aspects of life to enjoy, he spent his time trying out many endeavors – working as a pizza delivery guy, wiring

houses, writing computer codes in Washington D.C., building structures for the hydrology department, growing roses, playing in the dirt with his kids, acquiring Magic card decks, and even serving a short stint as a band manager. In his home near Tech, just behind MSEC, and later his home in Albuquerque, he grew a network of fantastic friends bonding through a love of games, food, and geeky conversations. Above all, he loved his friends and family and demonstrated that love everyday through his actions. His laughter, smile, and character will be fondly remembered and missed.

Maria Elise del Giudice, '91

Born in Meriden, CT, Feb. 20, 1964, died in Springfield, OR, on Oct. 23, 2017 after a long illness. Maria attended Pocahontas Co., WV, and Socorro, NM, schools.

She earned her B.S. in Science at NM Institute of Mining and Technology in Socorro. She is preceded in death by grandparents,



William F. del Giudice, Sr. and wife Leora Dyess del Giudice of Leominster, MA, Vincent Poutenis and wife Annie Mary Mazukna Poutenis of Shirley, MA, and brother Peter Francis del Giudice of Rio Rancho, NM. Maria is survived by parents, William F. del Giudice, Jr. and wife Elizabeth M. Poutenis del Giudice of Nashua, NH; husband Frank Shelly of Tucson, AZ; sister Anna-Marie Novo Gradac and husband Kevin, niece Sophia Rose Novo-Gradac of Davidsonville, MD; close friend Richard Miller of Oregon and many aunts, uncles, & cousins. As Maria and Frank cared for and housed many victims of domestic abuse, make donations to your local women's shelter in lieu of flowers.

Joshua J. Hill

30, of Albuquerque, passed away on Thursday, December 7, 2017. Josh was preceded in death by his brother, Jeremy Hill; his grandmother, Jonnie Mae Tutt, and his grandmother, Clara Hill.



He is survived by his wife, Liie Hill; parents, Rick and Harriet Hill; grandfather Wilbur Hill; and many aunts, uncles, and cousins.

Joshua accepted The Lord, Jesus Christ at a very early age and lived a Christian life as evident by his love of people. Motorcycle road racing was Josh's passion and he won many awards. He also enjoyed science, especially electron microscopy. Joshua started his career as an engineer at Sandia National Laboratories. Joshua

graduated from New Mexico State University and New Mexico Tech. NMSU awarded him the opportunity to attend the Lindau Nobel Laureate meeting in Germany where he met many Nobel Prize winners.

During his childhood, Joshua participated in the Royal Rangers of the Assemblies of God, obtaining much of his inspiration for Godly living and love of science. Joshua had a sweet personality and was loved by many friends and coworkers. Family asks that in lieu of flowers, contributions may be made to New Mexico Institute of Mining and Technology, Department of Chemical Engineering

Wendell T. Howard, '69 Class of 1969, B.S. Mining Engineering, passed away in August 2017. Wendell T. Howard was a hardworking xPGI/Unocal employee based for many years in the Philippines working to improve the facility and the process of geothermal operation in the country.



Charles Michael (Micky) Johnson, '72

Charles Michael (Micky) Johnson ('72), beloved husband, father, and grandfather, was called to his eternal resting place November 2, 2017. He entered this world on May 7, 1945 in Vernon, TX, born to C.D. and Lorene Johnson.

He is survived by his wife, Janey Johnson; daughters, Jeanne Kumpunen and Deborah Weeks; and stepson, T.J. Segrest; grandsons, Erich, Shaun, and Garrett Kumpunen, Brett Weeks, Jayden and Alexander Segrest; and granddaughters, Jessica and Amanda Weeks.

Micky received his bachelor's degree in Mathematics from New

Mexico Tech in 1967. Michael worked for EG&G/Honeywell on Kirtland AFB for 30 years, retiring in 2006.

Robin Elliott King ('12)

On March 31, 2017, his shining light went out and Robin spread his wings and left us. Born December 4, 1984, in Albuquerque, NM, he graduated from Eldorado HS and received a B.S. degree at NM Tech in 2012 in Computer Science.



He was employed in his dream job in Socorro and leaves behind many friends there. Those who wish to may donate in his name to the Socorro Animal Shelter, PO Box K, Socorro, NM 87801 or

to the Lupus Foundation of America. He loved all animals and all of us so much. We love & miss you Robin!

William Macey '42



William B. "Bill" Macey, 96 of Papillion, NE, Tucson, AZ, and Sidney, BC Canada passed away peacefully in his home on the morning of July 12, 2017. Bill was born in Buffalo, NY, on August 1, 1920 to parents Charles and Doris (Bourne) Macey.

Always gregarious, humorous, and giving, Bill completed his bachelor's degree in Petroleum Engineering in 1942 from New Mexico School of Mines (now New Mexico Institute of Mining

and Technology). He received an honorary doctorate in 1984 from New Mexico Tech for his accomplishments, achievements and dedication to the university.

Perpetually kind-hearted, he was very philanthropic, especially to his alma mater, New Mexico Tech (NMT). He contributed the majority of the funding for The Macey Performing Arts Center as well as The Macey Family Children Center, both at NMT in Socorro, NM. He supported education by establishing The Macey Scholars Program and The Macey Scholarship, both at NMT, a University of New Mexico (UNM) Business School Scholarship, a UNM Alumni Scholarship and a University of Arizona (U of A) Engineering Scholarship.

Survived by his loving and caring wife Cheryl Pulaski Macey; stepson Collin (Emily) Schwartz; grandson Thomas Schwartz; daughter Barbara (Joseph) Todd; granddaughter Sarah

(Tyler) Brewer; sister-in-law Ellen Pulaski; nieces Pam (James) Baker and Nancy (William) Hohensee; nephew Richard Poppenberg; numerous grand-nephews and grand-nieces; several great-grand-nephews and great grand-nieces; and his four-legged companions Molly and Bailey. He will be terribly missed by all.

Preceded in death by his parents; his wife Jean Mullins Macey; sister Doris Poppenberg; nephew Macey Poppenberg.

In lieu of flowers, please consider a donation to: Performing Art Series, New Mexico Tech; Children Center Endowment, New Mexico Tech; or The Macey Scholars Program, all at 801 Leroy Place, Socorro, NM 87801.

Kenneth C. Sukanovich '67

Kenneth C. Sukanovich, 72, of Lower Burrell, Indiana, died Tuesday, May 23, 2017, in his home with his beloved wife Marion at his side after a long battle with cancer. Ken was born Feb.

12, 1945, and was one of four siblings. He attended New Mexico Institute of Science and Technology, where he earned a degree in mathematical engineering.



He did a tour in the Army during the Vietnam War, where he served as part of the Elite Honor Guard. Shortly after, he was hired by Kmart, where he worked for more than 35 years earning numerous accolades and awards for his hard work, professionalism and dedication. He also worked for CVS Caremark and was a member of St. Margaret Mary Roman Catholic Church, Lower Burrell.

Ken is survived by his wife of 42 years, Marion Kenyon Sukanovich; two daughters, Wendee

Sukanovich (Mark Morgan), of Stafford, Va., Kristee (Gordie) Morgan, of Genoa, N.Y.; two granddaughters, Samantha and Alexandria Morgan; sister, Dorothy Stein, of Ligonier. He was preceded in death by his parents, Roy M. and Anna Starr Sukanovich; brother, Robert Sukanovich; and sister, Audrey Hensel.



Sebastian Thompson, '92
On September 8, 2016, I died. I was somewhat surprised by it. One moment I'm camping out in the Manzanita Mountains in NM close to Mom's house, then poof! No body, no form, just energy! Like I was before I was born on January 5, 1968, in Irving, Texas. As a physicist and nanotechnology engineer, graduating from NM Tech and working at Texas Instruments, Micron, and Global Foundries, I have always believed in the law of conservation of energy. Now I'm experiencing it, once again. In the simplest statement, energy does not get created and energy does not get destroyed. All my energy, every wave of

every particle that was me is still here.

I state this because I want you to think of me as not being gone. I am still all around you. On occasion, you'll have awareness of me: in the meteor debris streaking across your sky, in the glints of light off the January snow, in the sound of a hummingbird's wings.

And finally, since I didn't have time to say bye to anyone, I'm getting around to it now. I was always a procrastinator; don't know why it should be any different in this last transformation. Goodbye to my mom Sylvia and my dad Terry, to my relatives Kathryn, Shelley, Petar, and Uncle Mickey, to my cousins, and to my many friends and co-workers.

This 48 year voyage on this Earth with all of you has been rich with experiences and adventures.

I've already had my Celebration of Life event and Mom's going to sprinkle a portion of my ashes in Colorado this month and continue that tradition every September.

And finally, listen to the song "The Highwayman" by Kristofferson, Nelson, Jennings, and Cash. Turn up the volume. I'll *"always be around and around and around"*

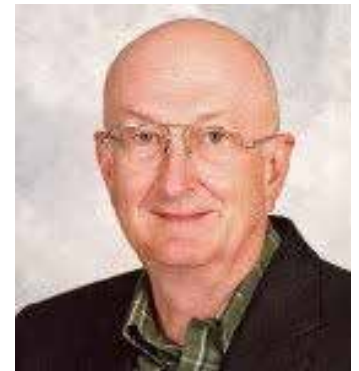
Ronnie H. (Ron) Westbrook, '62

Ronnie H. (Ron) Westbrook passed away on January 21, 2017 in Midland, TX, at his home peacefully with family at his bedside. Ron was born on Mother's Day, May 12, 1940, in Odessa, Texas.

He attended and graduated from New Mexico Institute of Mining and Technology in 1962 with a Bachelor's degree in Petroleum Engineering.

Ron is survived by his loving wife, Merlyn Westbrook, his sons,

Jim Westbrook of Salt Lake City, Utah, Derek Westbrook and wife Marla of Burleson, Texas, and Don Westbrook of Dallas, Texas; two step daughters, Laci and husband Jorge Cruz of Clovis, New Mexico, and Lindsey and husband Ty Stark of Tahoka, Texas; and eight grandchildren.



Ron spent most of his early years working with youth and sports related activities. His greatest thrill was working with Ben Milan boys' basketball program at the Old Park Center YMCA. He truly felt he was the luckiest man on the face of the earth. He loved his family, life, work, and sports, especially The Texas Rangers. He will be greatly missed by all who knew him.

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

a mechanical engineering student's eyes in an augmented reality

Benjamin Katko, a senior in Mechanical Engineering, grew up in Los Alamos, New Mexico. He began his education at UNM-Los Alamos, focusing on engineering courses. It wasn't until he continued working towards his degree that a relationship was forged between him and the Los Alamos National Laboratory (LANL).

Ben arrived at New Mexico Tech in the spring of 2016. He transferred from UNM-Los Alamos because Tech was cheaper and a good fit. When asked

about his experiences in the classroom, he says, "It's difficult, but not impossible. It's a commitment, and you have to be in the right mindset."

This is his first semester as an officer of the American Society of Mechanical Engineers (ASME), and is involved with Tau Beta Pi. ASME's plans include community outreach, with plans to conduct an aerodynamic workshop to the local middle school. They'll be covering basic principles, and demonstrate how varying structures cause planes to fly differently. Ben hopes this will motivate younger students to become interested in STEM.

Ben also believes that,

unlike other universities, there are opportunities to grow at NMT. "You don't get drowned out." He hopes that the experience from the classroom into research will remain relevant as technology advances.

Where research is involved, Ben is the team lead for the Augmented Reality project in the Mechanical Engineering Department's design clinic. Dr. Julie Ford wrote, "Ben took the initiative to propose it and work with LANL to guarantee their funding and sponsorship of the project." Dr. Ford also wrote, "This project aims to develop a futuristic, cyber-physical, human-machine interface engineering tools that

emanates from the mixing of virtual and physical realities."

Ben spent the summer at LANL building a mock facility prototype that he calls "smart infrastructure." A headset is used to pick up attached virtual



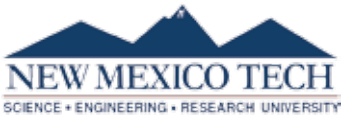
Benjamin Katko objects from a QR code because the code has edges that makes it easy for the headset to detect. The physical and virtual realities can be linked together, extending from one object to the space it occupies, to the bigger space, and beyond.

Over the summer, his poster was an award winner at LANL. He returned for classes and continues to work on his design. He hopes to present at the 2018 Student Research Symposium, and has plans after he graduates (May 2018) to continue his education, in pursuit of a Ph.D. with a crossover in disciplines.

The technology Ben and his team have developed is impressive.



View looking through the virtual reality headset.



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