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In This Issue:

General
SGA Rundown ............................................ 2

Sports and Club Spotlight
NMT Sports Highlights ........................................ 3
Club Spotlight-Society of Women and Engineers ............. 4

Student Spotlight
Veronica Espinoza ............................................. 5/6

Science and Research
Snow Days and Delays ............................................ 7
The Vulnerability of a Network Using Betweenness Centrality .... 8
NMTrends .......................................................... 9

Go See Do
Recycle Mania - Tech is Stepping Up and Standing Out .... 10
Bisty Badlands ..................................................... 11/12
Jones Hall Construction Update .............................. 13

Relax and Unwind
Sudoku and Crossword Answers .............................. 14

In our last issue, we included a crossword about Traditional Fighting Games. The answer key is as follows below. There's no prize for this one. But you get to feel good about yourself!

Answers:
2 Across: MortalKombat
4 Across: Injustice
5 Across: SoulCaliber
8 Across: KillerInstinct
9 Across: StreetFighter
10 Across: GuiltyGear

1 Down: Skullgirls
3 Down: KingofFighters
6 Down: Tekken
7 Down: DeadorAlive

Photo Contest Winners:
Front Cover: Justine Zimmerly
Back Cover: Jonathon Garcia

Congratulations! You will be contacted soon for your prize.

Relax and Unwind
"Correction does much, but encouragement does more." - Johann Wolfgang von Goethe
SGA Meeting Rundown: 2/8/20

1. There will be an open floor discussion in upstairs Fidel on Monday March 9th. President Wells will be addressing the 20/21 cost of attendance. This is the time to voice your concerns and ask your questions about next year's pricing.

2. The Dean of Students brought up that he is handing out meal tickets to faculty members who wish to go on lunches with students to discuss school-related material and career information. Students can also pick up these meal tickets for the same purpose.

3. There are new programs in both the Mineral and Chemical Engineering departments. Mineral Engineering now has a graduate program, and there is now both a PhD and Master's program in Chemical Engineering.

4. Most SGA departments are working on their Standard Operating Procedures in order to make the transition into next year's administration smoother and increase efficiency.

Jones Hall Construction Update

Jones Hall, the building directly across from Macey Center, connected by a bridge to Jones Annex, and currently swathed in scaffolding, is clearly under construction. Here is a quick rundown of the situation, based on new information since we covered it last fall.

Construction History

Renovations were initially scheduled for 2017. Estimated costs were seven million dollars, which was allocated from the state, but bids from construction companies were nine million. This left a funding gap that delayed the project for another two years. Alex Garcia, Director of Capital Projects, said that "the administration worked hard to get the project funded." Now, the construction that began in January is scheduled to finish in March 2021.

Issues

Built in the 1970’s, Jones has been in need of renovation for a while. Two major issues were leaks in the roof and poor climate control. Dr. Burleigh, Materials Department Chair, explained that because of the building’s swamp coolers it could reach 80% relative humidity in there during the summers.

Impact

Jones was home to both the Materials Engineering and Chemistry Departments, until Chemistry moved to the newly built Lopez Hall in the summer of 2017. With the construction, Materials has had to relocate, a process that was performed mostly over the winter 2019 holidays with the help of Facilities Management. The resulting severe decrease in space is challenging for a "very equipment intensive" discipline, explained Dr. Burleigh. Currently, the department offices are located in Speare, where the OSL used to be. Labs are scattered in five different buildings across campus. "The Materials Dept. is very thankful for the generous sharing of space from the Bureau of Geology, Chemistry, Earth & Environmental Science, Business Management," emphasized Dr. Burleigh.

Looking Forward

Major renovations will include a new roof, new windows, and new heating and cooling systems. There will also be upgraded plumbing and electrical systems. Together, these will make the building more energy efficient. A new stucco exterior will make it look "like a brand new building," said Director Garcia, and inside there will be new paint and ceilings. The Materials Department is excited to no longer need noisy compressors that go off frequently, and to have all of the electron microscopes in one location. Post-construction, Materials will be joined in the building by Chemical Engineering on the second floor.

-Evelyn Byrd
Sports and Club Spotlight

“Believe you can and you’re halfway there.” - Theodore Roosevelt

NMT Sports Highlights

Men’s Rugby
Match Report on the men’s first game of the season:
The Men’s team played a friendly against the Albuquerque Aardvarks here at Tech on February 1st. This game was the men’s first game of the season and gave them a chance to blow the cobwebs off after a 2-3 month break. At the beginning of the game the Miners started off poorly, with the Aardvarks scoring in the opening minutes. The Miners came back and scored two trys just before halftime. The score was 35-35. Way to go Miners!

Women’s Rugby
Match report on the women’s first game of the season:
The women’s team played their first game against NMSU on Saturday February 15th. The Miners started off strong scoring 2 trys before the first half ended. The women continued to dominate letting NMSU score only 1 try in the second half and NMT scoring 2 more trys in the second half. The final score was 26-7 NMT winning the game! Go Miners!

Sports Recruiting
Geroid Dunbar is going to Snow Canyon High School in St. George Utah to recruit for rugby. Geroid said this is probably the first time this has been done at Tech and he’s super excited to go and recruit athletes. 8 different high school teams will be playing in Utah.

Mens Soccer
The men’s soccer team had an away game on February 8th against UNM. They started off strong with a 2-0 lead in the first half. However, Tech fell to the Lobos 3-2. Geroid said the soccer team has improved tremendously from the last few seasons and is looking forward to seeing what they do the rest of the season.

New Mexico Tech Day at the State Capital:
Geroid Dunbar and Damian. Banks (President of E-gaming) went to the State Capital on February 3rd to talk about sports at New Mexico Tech. There was an E-gaming table set up with a computer and the games that the E-gaming club plays. There was also a rugby table set up with the teams jerseys, a match playing on a computer, and an NMT Miners Rugby sign. This was a great event where Tech informed other people why sports are important and what direction Tech plans to go in in the future. It was a key event in creating awareness of NMT sports.

Photos By: Samuel Baca
The Society of Women and Engineers club is a club that supports and promotes women in STEM and helps build an awareness of women in the STEM fields. Co-President of the Society of Women and Engineers Club, gave an overview of her club and why it is important. Grace is an Environmental Engineering major and senior here at Tech. She has been the Co-President of the club since last December and was the President last semester. Grace talked about how this club is a lot of fun and how great their group of women are.

This club does a lot of volunteering and fundraising. They just completed their biggest fundraiser of the year which was the Rose Sale that happened in early February. They will use some of this money to put on outreach activities for young girls in Socorro to help make young girls aware and interested in the STEM fields. Every year they go to the National SWE conference. This next fall it will be in New Orleans. It is the world’s largest conference for women in engineering and technology. It gives women a platform of support to help them pursue their interests in STEM, or continue growing as professional women in engineering and technology.

At this national conference, thousands of female engineers will make connections with each other, discuss struggles and solutions, and find new ways to support one another for the overall advancement of women in engineering and STEM. Grace said, “It’s always tons of fun and there’s always a lot of different women there from different backgrounds.” The weekend of February 21st the club volunteered at Super Stem Saturday with ARFL at the convention center. On pi day, these women will be at Explora in Albuquerque doing pi-related activities with little kids at the science convention center.

This club has about 12 active members right now, and wants to continue to grow. Grace said, “We are always looking for new members to join, it doesn’t matter what major or what grade you’re in, anyone is welcome! We meet every Wednesday in Jones Annex 108 at 6:00pm.”

SWE has helped Grace find her voice as a woman and feminist in engineering. She’s gotten to meet a lot of women in different majors who she may not have crossed paths with had it not been for SWE. Grace said, “Because misogyny is so ingrained in NMT and engineering, our SWE chapter tries to provide our members a network of women to support them throughout their academic and professional careers.” Grace is excited to see what the rest of this semester brings and can’t wait for all of the events that are coming up. She hopes to see new faces at their meetings on Wednesdays.

- Katelyn Green

Bisti Badlands

The Bisti Badlands is a unique and spectacular area in the Four Corners region of New Mexico. South of Farmington and north of Chaco Canyon, it is a wilderness area managed by the Bureau of Land Management (BLM). As such, camping and hiking are free and welcomed, as long as a few rules are observed. Motorized vehicles, mountain bikes, fires, and collecting fossils or petrified wood are prohibited. There are no water sources, so visitors must bring enough with them.

Visitors should also be aware of the history of the land and be careful not to venture onto adjacent tribal lands. The word Bisti originates from the Navajo word Bistahí, meaning "between the shale hills" or "among the adobe formations." The area is also called the De-Na-Zin wilderness, which originates from the the Navajo word Déél Náázhí, meaning "cranes." The area is also called the De-Na-Zin wilderness, which originates from the the Navajo word Déél Náázhí, meaning "cranes."

The two geological formations that make up the Badlands are the Kirtland Shale to the east and the Fruitland Formation to the west. Much of the material that makes up the area is volcanic ash, which erodes quickly and does not hold water, and thus does not support much plant life. Also visible are pieces of what appear to be pottery or brick, called "clinkers" after the sound they make when stepped upon. These are pieces of clay that were transformed during the burning of coal beds in an ancient fire.

Fossils are also common in the Badlands. One of the most famous is the Bisti Beast, a Tyrannosaurus dinosaur discovered in 1997. This fossil is currently located in the New Mexico Museum of Natural History in Albuquerque, where a robotic model also now graces the museum’s lobby. The skull of the Bisti Beast was scanned using X-Ray and neutron CT at Los Alamos National Laboratory. Riley Myers, a Tech student majoring in Computer Science and Electrical Engineering, helped to analyze that data to characterize the skull’s internal structures.

For more information on visiting and the history and science of this region, visit https://www.blm.gov/visit/bisti-de-na-zin-wilderness and http://www.nmmuseum.org/exhibits/permanent-exhibits/bisti-beast.

-Evelyn Byrd
Veronica Espinoza has been the Tech Student Regent for about a year now, and will serve until next spring. Interested in who she is and what she is doing for the Tech community, Paydirt sat down with her to chat. The following interview has been edited for length and clarity.

(Paydirt): Where are you from?
(Veronica): I grew up in Sunland Park, New Mexico, right next to El Paso, Texas. Right on the border.

How did you end up at Tech?
(V): I’m actually a transfer student. I went to Colorado School of Mines for about two years and decided that I didn’t like it. It was for multiple reasons, but one of the things was the culture they have. Especially for me, coming from a huge Hispanic community where everyone spoke Spanish, then all of a sudden being dropped down to a place where there’s that lack of what I’m used to. At that point, culture was a huge part of my identity, so I decided to come to Tech.

Tell us about your experience at Tech.
(V): From the times I visited, it felt like home. And it’s such a small community, you get to interact with everyone. You can have friends who are in very different majors than you are. You walk around and you recognize faces. It’s not as intimidating as being at a large school.

What does the Board of Regents do?
(V): We do administration and other entities report to us about what’s going on with Tech. We also get to vote on serious issues such as spending and tuition, and on officially approving things like the two new graduate programs in Chemical Engineering and Mineral Engineering.

What about you specifically as Student Regent?
(V): I’m basically the voice of the students on the Board of Regents. It’s funny, the administration always tell me, “you’re the boss,” but for me the students are my boss. I report to the SGA, and it is important to me to not only report but also to hear what other reports are so I know what’s going on. I also go to GSA (Graduate Student Association) meetings, because that’s another voice that I also offer office hours where any students who want to have a conversation about what’s going on are welcome to come. If they have any concerns I can bring them to the board.

Who are you with your academics?
(V): I am getting my B.S. in Chemical Engineering. I was looking at going for a Master’s in Mechanical Engineering, but the lab I work in right now with Dr. Harpather, they convinced me to go for my Ph.D. here. I’m super excited for all of the projects we have going on right now.

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It’s kind of hard to be with friends who don’t get what you’re going through. It’s great to come here and all of you are struggling together at two in the morning trying to finish homework. It creates a bond.

Clear, this issue is significant and has a lot of room for improvement. In the end, Christine said “recycling is something that’s so easy that we can do to make a difference.” She also emphasized that anyone can make a difference, and that every single plastic bottle can help. She said, “I am by no means perfect, but I do try to do what I can.”

Christine discovered RecycleMania (recyclemania.org) one day when wandering down a “recycling rabbit hole.” Since its founding in 2001, over a thousand different institutes of higher learning from across the U.S., Canada, Mexico, Puerto Rico, and Guam have participated in the 10-week competition. There are different categories based on schools’ goals and abilities to track recycling and trash, allowing institutions of all sizes to join in.

The program seemed perfect for Tech, and Christine was amazed that she had not heard of it before. She immediately reached out to Steve Hicks, Recycling Director, at steven.hicks@nmt.edu.

Now, the Committee is interested in further input from students, either as suggestions or becoming part of the Committee. The only student on the Committee currently is Christine. Those interested can contact Christine Burrill, Recycling Specialist, at christine.burrill@nmt.edu.

Finally, Recycling is also good for Tech’s reputation and recruitment efforts. Participating in RecycleMania, and just becoming a greener school in general, are important to “get our name out there.” Christine said. We are currently the only school in New Mexico that is competing; SFCC and CNM are both participating in the non-competitive “benchmark” category.

Go See Do
"Nothing is impossible, the word itself says I'm possible!" - Audrey Hepburn

RecycleMania - Tech is Stepping Up and Standing Out

New Mexico Tech is currently in the midst of RecycleMania, a recycling competition between colleges and universities across the U.S. and beyond. Curious how we are doing, how it works, and who is supporting this work, Paydirt reached out to Christine Burrill, the student who started it all.

Christine is a third year Ph.D. student in Earth and Environmental Science (EES). She has been a very strong proponent of recycling throughout her time at Tech, and played a major part in arranging the Sustainability & Renewable Energy Symposium in Spring 2019. When asked why she feels so strongly about this issue, she was ready with a few statistics:

- Between 2006 and 2017, 17 million barrels of oil were consumed to make plastic bottles in the U.S.
- Between 2008 and 2017 over 1,500 workers died during the oil extraction process.
- 92% of all plastic is not recycled.

The goal of RecycleMania is to bring attention to Tech’s recycling program through education and events, but there has not always been a program. In fact, the current program was founded in the fall of 2018, soon after the formation of the Tech Recycling Steering Committee. Prior to this, individual departments informally attempted to arrange internal recycling programs.

The end of March will bring our final RecycleMania ranking, but the need to continue recycling will not end. If the competition is successful, we will see Tech maintain awareness of this issue and lead the way as a green campus for the world to see.

-Evelyn Byrd

Veronica Espinoza, Our Student Regent

["Strive not to be a success, but rather to be of value." -Albert Einstein]
In a study analyzing data from the Agency for Healthcare Research and Quality, average health insurance premiums between 2013 and 2018 were compared, for each state. It was found that New Mexico sits at 9th place with a 31% increase in its marriage rate and nearly 16% decrease in its divorce rate, over the period between 2009 and 2018.

New Mexico may be suffering when it comes to insurance premiums, but according to another study, it is surpassing nearly every other state in highest marriage and lowest divorce rates. It ranks 2nd best, with a 28% increase in its marriage rate and nearly 16% decrease in its divorce rate, over the five years.

In comparison, the largest growing state was Arkansas at 31.70%, and the least growing was Wyoming at 7.59%. Of NM’s five bordering states, Colorado was ranked 49, right above Wyoming, at 10.39%. Utah sat at rank 45, with 15.37%, and Arizona at rank 41, with 16.58%. Texas was ranked 18 at 22.34%. The only state out of the five to surpass NM was Oklahoma at 4th place with 29.26%.

Special thanks to QuoteWizard and LendEDU for this information. These articles can be found on their websites. However, they may not be released yet, and as such, will be available later in time.

Skyler Matteson

Paydirt, in addition to its articles, receives submissions from time-to-time from independent sources. These submissions usually range in both author and content, but recently Paydirt received quite a few articles regarding trends in New Mexico and at NMT. I decided to compile this information into one article showcasing some of the interesting data analysts have collected.

In a study analyzing data from the Agency for Healthcare Research and Quality, average health insurance premiums between 2013 and 2018 were compared, for each state. It was found that New Mexico sits at 9th place for the largest growth in annual health insurance premiums, at a 26.17% increase between the five years.

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Mississippi claimed rank 1, with a large 31% increase in marriage and 34% decrease in divorce over the same ten years. Illinois sat at rank 25 with a 3.51% decrease in marriage rate. However, it also had the highest divorce rate decrease of 40%.

Switching over to NMT, it was found that, out of 1253 four-year colleges, New Mexico Tech had a 66.51% chance in applicants from 2008/09 to 2018/19, ranking our school as number one in NM, and rank 101 in the country.

At rank 1 was Southern New Hampshire University with almost a 600% increase in the ten year period. However, it is worth noting that SNHU has a wealth of online courses and uses an open enrollment policy requiring a high school diploma or GED. Many of the higher ranking colleges also had similar practices and courses.

Special thanks to QuoteWizard and LendEDU for this information. These articles can be found on their websites. However, they may not be released yet, and as such, will be available later in time.

Skyler Matteson
Science and Research
"There is nothing impossible to him who will try." - Alexander the Great

Snow Day and Delays

On February 11th New Mexico Tech got about 3-4 inches of snow and school was cancelled at 2:00pm due to inclimate weather. Students were ecstatic to have half the day off to play in the snow and destress from their studies. The athletic field was filled with kids throwing snowballs and making snow angels. One large group of students excitedly built a 10 foot tall snowman. The video of the students building the snowman was even on the news!

The men and women's rugby teams had a fun day playing tackle rugby in the snow as well. The next morning, there was a 2 hour delay due to icy conditions. As many of our readers may know, it's unusual for Socorro to get a lot of snow, if any, and the last known closure of a school day was back in 2015.

On the topic of weather, I talked with Jose Martinez Carlos, a PhD candidate for physics, who studies atmospheric physics and also has his masters degree in lightning research and Undergraduate Degree in meteorology. Jose has been here at Tech for 6.5 years and started here in August of 2013.

Jose had some information about the Great Socorro Hail Storm that happened in October of 2004. Jose was not actually present when it occurred, but was curious about this hailstorm because hail storms here in the United States are bigger than other places Jose has seen in Puerto Rico. What people told Jose about the hailstorm was that it happened very suddenly. So suddenly, it was barely seen on the radar or satellites.

The hail was grape fruit size and would bounce off the roof smashing windows and damaged a lot of the buildings and cars in Socorro. This multi cell hail storm system that happened grew to 10-15 kilometers in height where it gets very cold and that's why the storm was so violent. The higher it grew the more ice there was. This crazy and sudden event shocked the town of Socorro and left a lot of destruction in its path.

Jose talked about the storm and said, "If the storm system is not very big, and is not a super cell, but wanted to grow into a super cell, it falls as hail. Why some hail grows into big structures is hard to explain, but rain will reach a freezing level and graupel can form at higher levels." Jose talked about how the hail storm that hit Socorro had a very sudden and violent updraft with the help of M mountain creating a mountain system where temperatures were cold enough for the hail to form. This very sudden and violent storm lasted only about 10 minutes. Jose ended his interview saying, "It was a mysterious thing that happened here in 2004 and whos to say when it could happen again."

-Katelyn Green

The Vulnerability of a Network Using Betweenness Centrality

Michael Gonzales, a senior at New Mexico Tech who is majoring in mathematics, did an amazing research project at Los Alamos National Laboratory last summer in the subject areas of computer science and mathematics. The title of his epic research project was: Quantifying the Vulnerability of a network Using Betweenness Centrality. This was Michael's third summer working at LANL in the Theoretical Division of Applied Mathematics and Plasma Physics.

His research consisted of looking at how to quantify the vulnerability of a network using different algorithms to analyze a specific network. To give some insight on what betweenness centrality is, Michael went ahead and explained it. He said, "It is a measure of the influence of a vertex over the flow of information between every pair of vertices under the assumption that information primarily flows over the shortest paths between them." He looked at an open source data set of computer-to-computer interactions to see if it could get a lot of snow, if any, and the last known closure of a school day was back in 2015.

Michael learned a lot of new things while working at LANL. He presented his research poster at the student symposium and said, "I learned that it's really easy on large networks to actually get from one place to another since they are all highly connected." Michael talked about how he learned to construct a poster of his research and condense his two month long project and high level math into a one page poster. He learned how to present and communicate with other people and met a lot of new people as well.

When Michael was asked what his plans are after graduation he said, "I am going to graduate school here at Tech and am going to do the 5 year masters program in operations research and statistics. Michael wants to get a job in industry in the future possibly doing data analysis. However, his dream job would be sports statistics. After this, Michael wants to eventually become a math teacher because it is such a hard subject for most students.

Michael had some good advice for tech students that they should take away from this article. He said, "Look into research opportunities as soon as you can, whether it's here on campus or elsewhere. It's a great way to help you figure out what you want to do with your career and help narrow down what you really want to do. It's a really great way to see if you like doing research or whether or not application is better for you." Michael ended his interview with a great quote and said, "Pursue research jobs, research positions, and take advantage of all the opportunities given to you." - Katelyn Green