



**NM** College of  
**STATE** Engineering

**GODDARD**  
B R O A D C A S T

Winter 2018

# STUDENT BRIDGE BUILDING PROJECT REQUIRES MORE THAN ENGINEERING SKILLS

## New Mexico State University

students and their mentors spent two weeks in Nicaragua where they built a foot bridge spanning 110 feet to provide a small community access over a river that floods during the monsoon season.

The biggest lessons learned by students in Aggies Without Limits (formerly known as Engineering Without Boundaries) were not only about loads, measurements and materials to be considered in bridge design and construction. They gained invaluable life lessons that will change them forever.

“The experience is magical in my mind,” said Associate Dean Sonya Cooper, adviser. “I see these students grow five years over the course of two weeks in terms of their ability to work together, interact and be positive through any negative circumstances. Their emotional character grew in orders of magnitude.”

Victor Meraz, president of AWL, found it difficult to put into words. “This was an unforgettable life experience that we will cherish for the rest of our lives. We sacrificed countless hours for a cause bigger than ourselves, and the reward that came from completing a project that we spent a year working for is unfathomable,” he said.

Work for the Nicaragua trip began a year ago, planning, design work and fundraising



for the trip – it cost \$30 thousand alone in airfare, not to mention materials and supplies. Funds are raised by the students and this year, they were assisted with donations from General Dynamics, Rotary Club Alamogordo, Aggies Go Global and the NMSU Student Foundation.

The bridge was constructed in El Potrero, Nicaragua, near the city of La Trinidad, where approximately 100 families make their living farming corn and beans on steep hillsides. They live in huts constructed from bamboo and adobe with hard-pack mud floors. They have no plumbing or paved roads. A new addition of the past year is electricity. During the rainy season, the creek floods and they can't take their goods to market and the children are unable to attend school in the surrounding communities.

Read more at [enr.nmsu.edu/bridge/](http://enr.nmsu.edu/bridge/)



## “INFORMED” TO HIGHLIGHT NMSU ENGINEERING

The College of Engineering will be featured on “Informed” – an award-winning program that highlights stories and innovative concepts through documentaries on topics such as business, medicine, education, environmental issues.

Hosted by Rob Lowe, the series is distributed to public television stations and a video about the NMSU College of Engineering will air in February in the cities of Albuquerque, El Paso, Amarillo, Phoenix and Tucson.

The Informed Series production team spent a full day on July 14 at NMSU interviewing and filming in the College of Engineering.

Featured on the videos are interviews with College of Engineering Dean Lakshmi Reddi, and longtime college supporter and electrical engineering alum Eloy Torrez. Numerous student projects are also featured in the videos.

View the video at [enr.nmsu.edu/informed/](http://enr.nmsu.edu/informed/)



## TWO ENGINEERING ALUMNI HONORED AT HOMECOMING



The New Mexico State University Alumni Association honored two College of Engineering alums during Homecoming 2017 celebrations.

Eloy Torrez, founder, owner and president of SEI Group, Inc. was honored as the College of Engineering Distinguished Alumnus.

The Distinguished Alumni awards, established in 1956, recognize living NMSU alumni who have achieved national or international distinction through their accomplishments, leadership and meritorious service that reflects the quality and advancement of NMSU.

After earning a bachelor's degree in electrical engineering in 1970 from NMSU, the Hondo, New Mexico, native graduated from UCLA with an engineering master's degree in 1976.

Torrez has kept close ties to NMSU throughout his career, serving on various committees and making generous contributions. Most recently, he funded the Eloy Torrez Family Learning Communities in Engineering, which offers peer tutoring and mentoring services to all engineering students.

Also recognized was Frank Seidel, this year's recipient of the James F. Cole Memorial Award for Service. Seidel is a 1982 graduate of the College of Engineering and president and founder of Seidel Technologies.

The James F. Cole Memorial Award for Service, established in 1966, recognizes those who have shown progressive support, dedicated involvement, impactful civic and humanitarian service at NMSU and within the communities around them, and notable professional service.

Seidel also serves on several boards and committees and is a generous financial contributor. He and his wife, Jennifer, provided the funding for the Department of Chemical and Materials Engineering to have its own brew lab, which will help expand the department expand a popular field of study for chemical engineering students.

Read more at [enr.nmsu.edu/alumni-honored/](http://enr.nmsu.edu/alumni-honored/)

## OUTSTANDING SENIOR TO PURSUE STUDIES IN **WATER RESOURCE ENGINEERING**

College of Engineering outstanding Senior Victor Meraz graduated in December with a bachelor's of science in mechanical engineering technology and minor in renewable energy.

During his time at NMSU, Meraz worked on numerous projects, internships and co-ops. Meraz was elected vice president of finance and president of Aggie Without Limits, a nonprofit organization established at NMSU. The organization's goal is "To improve the daily lives of developing communities



through sustainable infrastructure," and he has done just that.


As the president of AWL, Meraz' role was to manage the large group

of active members from throughout NMSU. Meraz played a crucial role in the designing, building and fundraising for a 110-foot wooden-truss pedestrian bridge for a community of 100 families in Nicaragua this past summer. Meraz personally put more than 1,000 hours into the project.

"I would rate Mr. Meraz in the top 10 percent of all the students I have encountered in more than 25 years of teaching at the university level. Mr. Meraz is truly a fine student, but more importantly, an

exceptional person with amazing professional and personal ethics," said Thomas Jenkins, Engineering Technology and Surveying Engineering Department Head.

Meraz will continue at NMSU for a master's degree in water resource engineering tailored to focus on thermal fluid systems. In the future, he hopes to work in the renewable energy and sustainable building arena where he can apply his installation, management, design and fundraising skills to successfully complete projects.



## ELECTRICAL ENGINEER WORKS TO MAKE NEXT-GENERATION MOBILE TECHNOLOGY A REALITY

**The number of wireless devices** connected to mobile networks is estimated to be three times the size of the global population by the year 2020. Smartphone traffic will exceed PC traffic. Global Internet traffic in 2020 is anticipated to be 95 times the volume of the entire global Internet in 2005. Some 250 million vehicles will be connected to the Internet and there will be 27 billion machines communicating with one another.

But will the technology be there to make it possible?

David Mitchell, assistant professor of electrical and computer engineering at New Mexico State University, is working to help meet those demands estimated by Cisco Systems Inc. Mitchell's research is funded by a newly awarded, three-year-National Science Foundation grant to develop technologies to enable the next generation of network communication known as 5G.

“We have reached the fundamental limits of current technology. We will have to develop new technologies to meet the demand of next generation communication networks,” said Mitchell. “Along with the smart phones we have today, we will have smart cars, smart homes, biological sensors used in medicine, and all kinds of machine-to-machine applications that will rely on next-generation network communication.”

Mitchell and his colleagues' goal is to develop technologies with the ability to handle large amounts of data and to transmit that data quickly. They are focusing on novel methods for network users to work cooperatively, enabling more efficient connections within and between existing networks.

“The ground-breaking result would be to design schemes tailored to modern networks that can accommodate more data than ever

before, and to do it faster and with more reliability,” said Mitchell.

Future generation communication systems are expected to be capable of handling 10,000 times more traffic than current 4G systems, with the time between transmission and receipt of communication being less than one millisecond.

“Broadband speeds will double. Video traffic is anticipated to make up 82 percent of Internet activity,” said Mitchell. “While streaming video is one important aspect, maintaining reliability for all types of applications is critical. For example, healthcare monitoring requires complete reliability and it needs to be immediately accessible.”

**Read more at**  
[enr.nmsu.edu/mobile-technology/](http://enr.nmsu.edu/mobile-technology/)

# HIGHEST HONORS GRADUATE AIMING FOR PH.D.

**Highest Honors Graduate** Samantha Ceballes graduated this past December from New Mexico State University with bachelor's degrees in both aerospace engineering and mechanical engineering with a minor in mathematics, and a 4.0 GPA.

Since the beginning of her academic journey at NMSU in fall 2013, Ceballes has been a crimson scholar and on the Dean's List. She has received three undergraduate research scholarships/fellowships and additionally, had internships at Sandia National Laboratories and Johns Hopkins University Applied Physics Laboratory. She has published articles in nine journals, with several others under review or in preparation, which positions her well for her next academic endeavor.

Ceballes plans to continue her education at NMSU, pursuing both master's and doctoral degrees within three and a half years. She then hopes to become a professor or return to a national laboratory to work in research and development.

During her time at New Mexico State University, Ceballes was actively involved in the American Institute of Aeronautics and Astronautics NMSU student chapter. She was also the president of SIGMA Gamma Tau Aerospace Engineering Honor Society for two years.

"I am very impressed with Ms. Samantha Ceballes' leadership abilities while participating in numerous activities. She is the best rounded student I have met on the NMSU campus," said Ruey-Hung Chen, Mechanical and Aerospace Engineering Department Head.



# INVENTIVE GRADUATE EARNS MASTERS IN INDUSTRIAL ENGINEERING

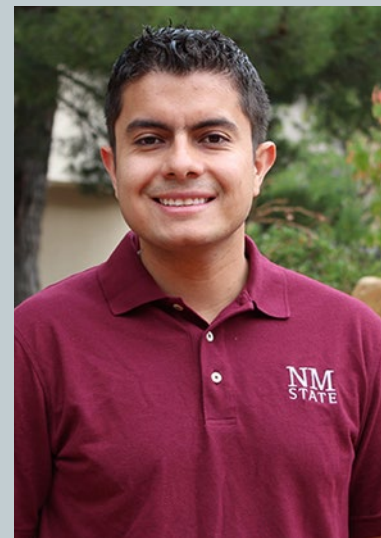
**Outstanding Graduate** Student Jose Carlos Murguia received his master of science in industrial engineering. His research focuses on determining the energy savings obtained from the use of high-reflectance cool roof technologies on commercial buildings in the United States.

Murguia has extensive experience in his field with a strong background in sustainability, public utility policy, cool roofing and entrepreneurship. He has presented his research at numerous conferences, including the Society for Advancement of Chicanos/Hispanics and Native Americans in Science in Salt Lake City, Utah, and the Society of Hispanic Professional Engineers Conference in Seattle, Washington. He constantly looks for ways to expand his knowledge and excel and has several professional certifications, including Public Utility Regulations and Economics and Lean Six Sigma.

Murguia currently works as a project analyst at Arrowhead Center for New Mexico Small Business Assistance where he has utilized his exceptional entrepreneurial skills. Earlier this year, he participated in Arrowhead's Launch program for entrepreneurs to start his own business KoolArmor. He won \$20,000 of seed investment, and today he is the CEO of KoolArmor, LLC.

In 2015, Carlos earned his bachelor of science in industrial engineering from Instituto Tecnológico Superior de Uruapan in Michoacan, Mexico.

"In Carlos, I see drive, enthusiasm and intelligence coupled with a strong desire to learn and perform quality research and to play an important role in the betterment of society," said Delia J. Valles-Rosales, industrial engineering associate professor.



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"Goddard Broadcast" pays homage to wireless communication pioneer Ralph Willis Goddard, one of the founders of the engineering school in 1914, and former dean of engineering at NMSU, originally known as the New Mexico College of Agriculture and Mechanic Arts.

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