

# VISION



**“Building tomorrow’s mathematicians, engineers and scientists...today!”**

**Winter Issue, 2015**

**www.nmmesa.org**

## New Media, Same Commitment

**Toney Begay**

*NM MESA Executive Director*

Hello NM MESA supporters and interested parties! I would like to welcome you to the NM MESA newsletter. In order for an organization to move forward and be successful, it needs to incorporate new ideas by new people.

This newsletter is a good example. Mr. Rick Cole was hired by NM MESA in the summer of 2014. Rick is a professional journalist with decades of experience in both print and broadcast journalism in addition to serving as a high school journalism instructor. He has also experience in creating electronic newsletters and has stepped forward to initiate a NM MESA electronic newsletter. I thought it was a great idea as we had a printed newsletter in the past and recently, NM MESA staff and its Board of Directors have discussed creating an electronic newsletter. NM MESA is fortunate to have Rick, who is willing to create the newsletter, on board.



*Photo courtesy of Northrop Grumman*

**At a recent Electric Car Challenge, Sandia Laboratory representative Amy Tapia presents NM MESA Executive Director Toney Begay with a check to support STEM education efforts.**

NM MESA is in its 33rd year and has a lot of events, stories, and announcements to keep the readers informed. We are elated to be in 106 schools and 31 school districts throughout New Mexico. We are also encouraged to have numerous partners, collaborators, and supporters, including community members and parents. It is our hope that this electronic newsletter helps our stakeholders learn more about NM MESA.

One recent success story about NM MESA is the recognition of being one of “The Best Places to Work” as determined by Albuquerque Business First. This is the highlight of 2014 and we are very proud to have an organization where everyone is respected and works well together. This also satisfies a goal of the NM MESA strategic plan, to have a “Great Place to Work and Serve.”

NM MESA has served thousands of students over 33 years. These individuals are in our schools or society at large contributing to academic achievement, engineering accomplishments, medical innovations, entrepreneurial business and active citizenship amongst many other endeavors. Some of them list their achievements in a separate article on page two of this publication. We are proud of all of them. We are “Making Tomorrow .... Today.” Enjoy our newsletter and do not hesitate to provide feedback on how we can continue to improve our service to New Mexico through this medium, our workshops, site visits, field trips, competitions, service learning, partnerships with other educational entities or industry. Thank you.

## MESA Day is Now MESA Days; Middle School and High School Separate for Feb. 21 and Feb. 27

There comes a time when an event grows to the size that its format must be changed. That time has come for New Mexico MESA Day, the competition highlight of the annual MESA calendar.

The last several MESA Days have featured well over a thousand competitors and advisors, including more than 1,300 last year. Putting that many students, ages 11-18, in one venue has resulted in “organized chaos” according to NM MESA Deputy Director Linda Andrews in a staff meeting last year. Thus, in order to increase the quality of the event and make sure that the MESA Day experience was consistently positive for student participants, a decision was made by NM MESA to separate the

high school and middle school competitions into two distinct venues.

Under the guidance of NM MESA State-wide Program Coordinator Anita Gonzales and with countless hours of preparation by the entire NM MESA staff, MESA Day is now MESA Days: Middle School MESA Day – Saturday, February 21, at the University of New Mexico and High School MESA Day – Friday, February 27, at the Las Cruces Convention Center. The MS MESA Day features 716 contestants and 73 advisors while the HS version includes 738 competitors and 77 advisors.

Scores of officials, volunteers and bus

**See MESA Day page 3**



*Photo courtesy of Santa Fe Community College*

**Santa Fe Community College President Randy Grissom, left, meets with NM MESA North Central Regional Coordinator Nicholas Kunz to collaborate on upcoming STEM activities on the SFCC Campus.**

## NM MESA’s NC Region Begins Partnership with SF Community College

**Nicholas Kunz**

*NC Coordinator*

NM MESA’s North Central Region has established a formal partnership with Santa Fe Community College (SFCC), which has served as a gateway to lifetime success for countless students since 1983. With over 100 credit and noncredit programs, SFCC serves more than 15,000 students from Santa Fe and surrounding areas each year. And they love to work with young people to help them forge the path to a bright future!

They are now donating large and small group meeting space for MESA events, as well as full time office space for the North Central Regional Coordinator. SFCC also provides interactive workshops (in its state-of-the-art facilities), faculty guest speakers, campus tours, and question and answer sessions between students and SFCC staff at all MESA events.

In September of 2014, over 120 students from North Central Region MESA schools traveled to SFCC for the region’s annual Leadership Summit. After an exciting round of questions & answers and door prizes with SFCC Recruitment staff, students heard a speech about physics from a scientist at Los Alamos National Labs. They also participated in a teambuilding workshop and an interactive “Leading your MESA Day Preparation” workshop. Final-

ly, students heard from SFCC’s Phi Theta Kappa Honor Society and learned how to join and ensure college success.

Over 180 students returned to campus in mid-November of 2014 for the Regional Rally. In preparation for the statewide MESA Day competition in February, they tested their prosthetic arm prototypes and received valuable feedback and advice from volunteer scientists and engineers. Excellent designs were presented at both the middle school and high school levels and judges were impressed with the overall quality of student work. Each team, comprised of two to four NM MESA students, also participated in a Brain Anatomy Examination activity, as well as an Alice Computer Programming workshop.

So what’s on tap for the future? NM MESA will continue to work with SFCC to provide valuable on-campus experiences for high school and middle school students. The 2015 spring semester will see beneficial collaboration with SFCC’s Sustainable Technologies Center. There will be workshops...field trips...internships...and more! It’s easy and affordable to become a college student at SFCC, and the college offers a wide range of dual-credit classes for high school students! For more info, check them out at [www.sfcc.edu](http://www.sfcc.edu).





# New Mexico MESA Alumni Making a Difference Over the Years

Compiled by John Davis  
NM MESA IT Manager

MESA alumni have transformed their high school education into meaningful college and professional careers. More than four dozen NM MESA alumni responded to a survey this past fall explaining what academic and/or career vocations they were pursuing. The answers are varied but consistently indicate excellence in achievement. Current MESA students can be inspired by what their predecessors have accomplished.

Year Graduated High School and What are you doing now?

2013    Currently studying at the University of New Mexico for a major in Economics and a minor in Peace Studies, Languages (French & Arabic), and Honors.

2013    I am currently enrolled at Luna Community College taking summer courses until the Fall I will be attending Eastern New Mexico University and major in pre-med!

2013    I will be attending New Mexico Institute of Mining and Technology. I hope to major in Mechanical Engineering and go on to study and work in nanotechnology.

2013    I am currently working as a hostess at the restaurant Los Cuates. I have two trips planned for the summer, one to San Elijo in CA, and one to Cabo in Mexico at the end of the summer. In the fall I will be attending New Mexico State University for a degree in Horticulture. I will hopefully go on to Colorado State University for a masters in Botany.

2013    I am planning to attend New Mexico Tech in the fall with the beginning pursuit of Computer Engineering. I am still unsure however about what I want to major in by the end of my Baccalaureate years.

2013    I am currently looking forward to an internship in the fall with Northrop Grumman.

2013    I am currently working as an IT intern at Carlsbad Municipal School District. I will be going to New Mexico Institute of Mining and Technology this fall. I intend to study Mechanical Engineering.

2013    Attending UNM for Civil Engineering

2013    ATTEND NMHU FOR 2 YEARS AND I HOPE TO TRANSFER TO NEW MEXICO TECH TO COMPLETE MY DEGREE

2013    Beginning my University Life at UNM to earn a major in economics and minor in Peace Studies and Languages.

2011    Going to NMSU to get a degree in chemical engineering.

2011    University studying Civil Engineering

2009    Flying helicopters for the Navy.

2008    Completing my BS in Computer Science and working towards a MS in the same field. I study and practice cyber-security, and have interned with both the Department of Defense and Department of Energy.

2008    finishing up school at the University of New Mexico to become a high school drama teacher

2006    Graduate Student at MIT

2006    Earning a Master's degree in Statistics and Operations Research at New Mexico Tech.

2006    Work as an auditor at KPMG

2006    Software Development Engineer in the Xbox Console Division of Microsoft.

2005    Graduated Drexel University w/ Mechanical Engineering degree in 2010. Currently working as Reliability Engineer for PECO Energy, a Philadelphia area electric distribution company.

2005    Doctoral Candidate at Indiana University Bloomington studying seasonally divergent physiological mechanisms regulating aggressiveness in female Siberian hamsters (Phodopus sungorus).

2005    I am currently an Academic Advisor at Dona Ana Community College.

2005    Completing a Master's in Public Health at the University of Utah, with an emphasis on women's health and family planning.

2005    I'm currently attending Stanford Law School.

2005    Talent Management Analyst for Next Street, a merchant bank that provides business advisory services and access to capital to America's urban small businesses and nonprofits.

2005    I'm a PhD student in Nanoscience and Microsystems Engineering at the University of New Mexico.

2004    Dennis Ramirez is a doctoral student in Curriculum and Instruction at the University of Wisconsin-Madison, and game designer. Dennis is interested in how new technologies are used in, and out, of the classroom to support learning. His main area of research focuses on how failure impacts learning, especially in games. Prior to attending UW-Madison, Dennis received his MA in Learning Design and tech

2004    I am a Manufacturing and Engineering Associate with General Mills.

2004    I work in Development for New Mexico PBS (KNME TV).

2004    Medical student

2004    I am set to graduate from Kansas State University in May with a PhD in Animal Science (Beef Cattle Nutrition area of focus) and have accepted a faculty position at West Texas A&M University.

2004    I am in my third year of medical school at UNM!

2004    Working for the Traffic Engineering Division for City Government

2004    Currently: Analytic Scientist, Fair Isaac Corporation, MS, Statistics and Computational Finance, Purdue University, May 2010, BS, Management, BS, Mathematics, New Mexico Tech, May 2008

2003    I am teaching engineering through Project Lead the Way at Chaparral High



School in the Gadsden Independent School District in southern New Mexico.

2003    I am a Biologist with the United States Environmental Protection Agency (US EPA) in Washington DC.

2003    I am currently employed full time as a flight nurse with Med Flight Air Ambulance and working part time at UNM-Hospital in the Adult Intensive Care Units as a staff nurse. In the meantime applying to graduate school for an anesthesia program.

2003    Clinic Supervisor for Mountain Park Health Center WIC Program. Full bio on reneherrera.com

2003    Received my B.S. in Biology and B.A. in Chemistry from the University of NM, Received my PharmD from U of AZ, Currently a pharmacy administration resident at Hennepin County Medical Center and working towards an M.S. in Social and Pharmacy Administration from the U of MN

2003    I graduated from NMT in 2008 and 2011 with my General Studies then Environmental Engineering B.S. Degrees. I am currently employed by the Albuquerque Bernalillo County Water Utility Authority as a Treatment Plant Operator at the Southside Water Reclamation Plant.

2003    B.A. Political Science/Pre-Law at University of New Mexico – 2008, Current EMBA Graduate Student at UNM Anderson – 2014, Government Relations & Marketing Consultant

2002    I am currently teaching 3rd grade with the Las Cruces public schools. I am living in Las Cruces with my husband and daughter. I completed my masters degree in elementary education from NMSU in 2008.

2002    Graduated with an MS in Biology from University of Nebraska at Kearney in 2010

2002    Franchise Operations Director for Haytess/DW3 LLC

2002    Government Relations at Sandia National Laboratories

2002    I am a human factors scientist within the Global Experience Design studio at Honeywell.

2000    Surgical Neurophysiologist

2000    NMSU graduate now working at Harder Mechanical Contractors at the Intel Ronler location. My company is currently doing the process piping for the new Intel D1X fabrication facility.

2000    I am a stay-at-home mom, homeschooling my 2 young daughters, and loving it! It is a very rewarding work that I do. I live back in the Penasco area, after completing college and an internship, and working as a Registered Dietitian for a while. My husband is just finishing his 6th year teaching at Penasco schools.

2000    I am a part-time Research and Development technologist doing surface analysis at Sandia National Laboratories in Albuquerque. I am also married and mother of three.

2000    Currently I am Financial Business Analyst with Los Alamos National Laboratory. I oversee the budget for multiple divisions and projects. I also currently serve on the City Council for the City of Espanola.

2000    Software Support Technologist at Sandia National Laboratories

2000    I am a Business Operations Manager at Sandia National Laboratories.

1999    Reservation Sales for Walt Disney World Resorts

1999    Earning my teaching license in math and science

1999    Systems Engineer at Dell

1999    Working as a Weapons Systems Engineer at Los Alamos National Laboratory.

1999    Systems Engineer at Lockheed Martin.

1999    I am working full time and trying to get into graduate school.

1999    I am General Counsel for the NM Department of Cultural Affairs.

1999    I am currently a Teacher at Sarracino Middle School in Socorro

1998    Senior Member of Technical Staff R&D Materials Science; Sandia National Labs

1998    Currently I am a teacher and vice principal at a Catholic elementary in San Jose, CA.

1998    I am working as a private practice attorney in Albuquerque, NM.

1997    I work in the behavioral health field. I'm presently the clinical supervisor for Native American Connections Intake/Assessment department. I feel the leadership, critical thinking skills and & encouraged creativity of MESA really helped me develop my leadership capacity at a young age.

1997    Graduated from NMT in Socorro in 2002 with a BS in Mathematics and a BS in Psychology. Graduated from the Southern California College of Optometry in 2006. Completed a Residency in Pediatric Optometry and Vision Therapy in 2007. Worked for 4 years as an assistant professor at SCCO for 4 years. Moved to Rio Rancho in 2011 where I work as a pediatric optometrist at City of Vision Eye Care.

1997    I am a neurophysiologist. I monitor nervous system activity during surgery. This entails measuring electromyograms (EMGs), transcranial motor evoked potentials (tc-MEPs), somatosensory evoked potentials (SSEPs), electroencephalograms (EEGs) and other related measurements in order to help maintain the integrity of the nerves, spinal cord and brain while the surgeon is working on or near these areas.

1997    I work for the City of Las Cruces as a Human Resources Analyst.

1997    Working for the city (COA). Just got a BA from UNM in Economics.

1996    I'm the Chief of Marketing and Outreach for Big Brothers Big Sisters of Central New Mexico.

1996    Mechanical Engineer at Sandia National Labs

1996    Engineering Analysis at Los Alamos National Laboratory

1996    UNM instructor

1995    I am employed at Sandia National Laboratories, and have been for 19 years. I



# MESA Students Will Experience State Legislature

St. Patrick’s Day will be more than a celebration of shamrocks and corned-beef hash for 125 New Mexico MESA students. These students and their teachers will also be participating in MESA Day at the New Mexico Legislature in Santa Fe.

For over a decade, NM MESA has had a day designated as NM MESA Day each year during the gathering of the NM Legislature. This year’s event will include a series of guest speakers who will address these future scientists on the legislative process, civics, the importance of education, education legislation, Science, Technology, Engineering and Math (STEM) college degrees, career choices and inspiration on how they can improve society now

activities or setting standards for educational success, such as the currently proposed bill to mandate reading at the third grade level in order for students to pass to the fourth grade.

Legislators will also engage in discussion with students regarding their MESA experiences, how these have shaped the quality of their education and in what ways MESA is helping prepare them for the future. As a part of that discussion, students will be submitting hand-writtend letters detailing what MESA has been doing in their schools, how the program complements their science and math education and what could be done to make it even more beneficial.



Photo courtesy of The Daily Lobo

**March 17 is the day MESA Students from New Mexico’s central regions will enter the halls of the “Roundhouse,” the NM State Capitol. Students will not only tour the Capitol, unique in architecture amongst all the nation’s state capitols, but interact with legislators and observe working committees and legislative sessions.**

and as career professionals and leaders of their own families in the future.

The agenda for the day includes a meeting with Steve Arias, New Mexico House Chief Clerk, the NM MESA Board of Directors, delivering letters to legislators, observing committee hearings, special guest presentations, observations in both the house and senate galleries, a tour of the NM State Capitol (the Roundhouse) and additional committee observations.

The legislative field trip serves to education students on the relationship between science and government and between non-profit agencies and public grants. Students will learn how science-based policy evolves from ideas to bills, to bills with amendments, to bills rigorously debated upon, voted on and ultimately enacted, sometimes after considerable modification.

Students will learn that this process is followed for all kinds of legislation, be it the diversion of water from a river in order to support a growing city and related ac-

The field trip also provides a valuable opportunity for students to see how their government works and why it is important to be an engaged and active citizen. Students see the virtues of leadership, the rationale behind parliamentary procedure, the necessity for confrontation, the essentials of public speaking skills, teamwork and the ability to effectively debate the many sides of an issue.

Each year NM MESA sponsors a legislative field trip for different regions of the state so that students from every demographic, urban to rural and public school to charter and private schools, have the opportunity to witness the workings of government. This sustained effort is resulting an increased interest in government studies among high school students.

NM MESA has been promoting educational enrichment for students throughout New Mexico for 33 years. Within its mission, NM MESA provides students with leadership development and the trip to the legislative session is an annual highlight.

**MESA Day from page 1**

drivers will work each event so that more than 1,000 individuals will be involved in each fair, making MESA Day one of the largest scholastic events in the state.

“It only made sense splitting it (MESA Day) into two separate events,” explained Central Outer Regional Coordinator Rick Cole. “Just as the New Mexico Activities Association had to break up the state track meet into two different events by classification, A-AAA and 4A-6A, for the sake of management, MESA is making quality more important than quantity.”

After the 1992 Olympics, The International Olympic Committee had to separate its summer and winter events into alter-

nating cycles as managing the events in the same year was becoming cumbersome and inefficient. Thus, in 1994, Lillehammer, Norway hosted the Winter Olympics while the Summer Olympics waited the routine four years to be held in Athens, Greece. And such has been the spacing of the Olympics ever since. Now fans get to cheer the Olympics every two years instead of four.

MESA fans can now cheer on their middle school and high school competitors back-to-back weekends rather than trying to find their star student scientists in a colossal number of groups, sub-groups and color codings.

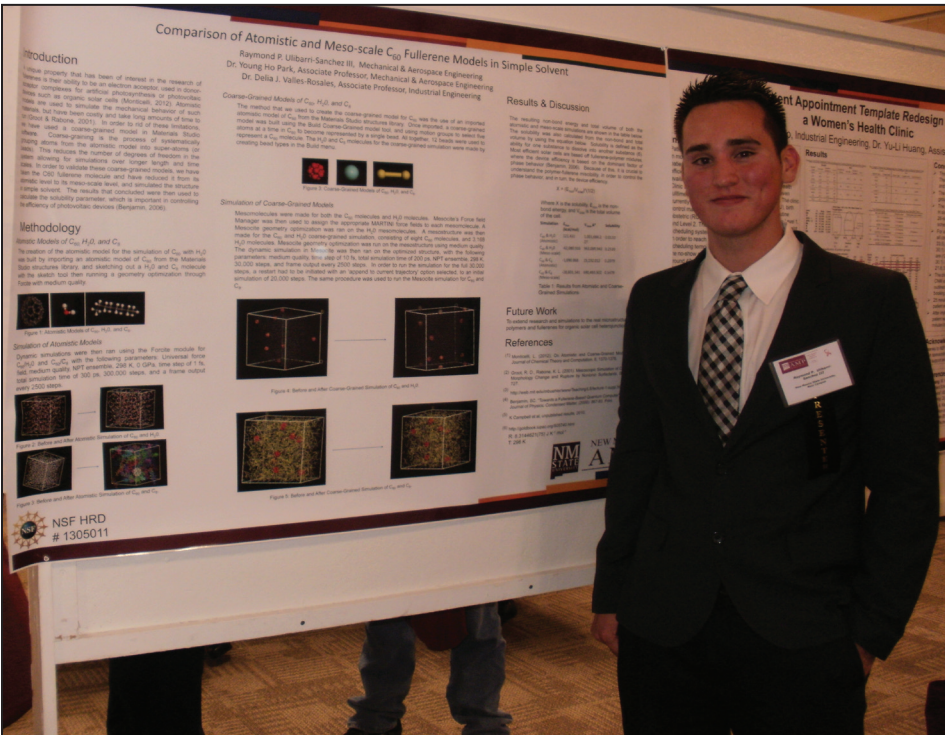


Photo by Rick Cole

**NMSU Senior and former MESA student Raymond Ulibarri-Sanchez presents his original reserach on Fullerene Models at the 2014 AMP Conference.**

## Raising the Volume on AMP

Anita Gonzales

*Statewide Program Coordinator*

On October 3, 2014 over 75 students, advisors, and staff from the North and Southwest MESA Regions attended the annual Alliance for Minority Participation Conference at New Mexico State University. MESA students from Robertson High School, West Las Vegas High School, Onate High School, Deming High School, and Las Cruces High School were able to view student research projects and hear insightful presentations from college-aged and New Mexico State University faculty presenters.

In addition, one of our MESA students, Aretha Deng, presented data from her recent research. Deng is a student in the 10th grade at Las Cruces High School and plans to pursue a career as a scientist but has so many interests that she does not yet know which specific field will be her specialty. Her work on this study, funded by her school’s Young Scholars Program, has taught her to conduct high level research

and to read scientific studies. Only four high school presentations were selected to present among more than four dozen college students, some of whom were former MESA students.

AMP is a nationwide entity that hosts many research conferences around the nation each year. It has been instrumental in helping minority students get the practical experience in scientific research to prepare for careers as scientists and engineers. As a result, thousands of African American, Native American, Latino and Asian-American students have developed the skills necessary to embark on society-changing careers.

NM MESA is proud to partner with AMP in preparing students for STEM-related studies at the university level. Many former MESA students, such as Raymond Ulibarri-Sanchez pictured above, are engaged in cutting-edge research in academia or industry.

**Students from Las Cruces Onate High School collaborate on methods of organizing data at a workshop during the 2014 AMP Conference at the Las Cruces Convention Center. The Center will also be the site of the 2015 High School MESA Day.**





# Central Outer Regional Rally is Multi-Faceted Success

**Rick Cole**

*CO Region Coordinator*

Not often can students experience swimming sharks, paddling ducks, blooming flowers and science competitions all in the same day. But that was exactly what MESA students did at the Central Outer Regional Rally, conducted under crisp, blue skies November 7 at the Albuquerque Aquarium and Botanical Gardens.

Students from 13 of the 17 CO schools participated in the all-day event, which featured competition in prosthetic arm design and construction, Alice computer programming and brain anatomy and physiology knowledge. Also included in the agenda were tours of the aquarium and the botanical gardens, service learning (volunteer work in the gardens), guest speakers on New Mexico flora and fauna and an outdoor catered luncheon by the Shark Reef Cafe. Almost 200 students and advisors completed the five rotations of the Rally schedule, culminating in an awards

ceremony for contest winners.

In the middle school division, Truman Team #1 won the Alice contest while Taylor Team #5 won the prosthetic arm competition and Taylor Team #1 won the brain event. For the high schoolers, Cibola Team #1 clinched Alice and the Brain while Belen #1 dominated the prosthetic arm. Overall winners for the middle school were as follows: 1st place, 552 points - Taylor #4 (Hope Chavez, Seven Ballard, Vincent Minor and Alyssa Orton); 2nd, 534 points - Truman #2 (Grace Drew, Janet Botello, Madison Calderon, Mage Niles); 532 points - Taylor #5 (Brandon Garcia, Natalia Saiz, Derren Owen Jr and Kiley Reil). Overall winners for the high school were 1st place, 749 points - Cibola #1 (Donovan Glasgow, Janae Padilla, Ezra Montoya, Johnathan Garcia); 2nd place, 697 points, Belen #1 (Mekiel Olguin, Felicia Griego); 3rd place, 679 points - Volcano Vista #3 (Jacob Wardell, Ryan Wardell, Isabella Rivera, Newell Ramsey). Thus, Taylor Middle School and Cibola High School estab-

lished themselves as the regional leaders in preparation for the February MESA Day.

Excitement permeated the atmosphere during the award ceremony in the botanical garden outdoor theatre. Indeed, Taylor Middle School student Alyssa Orton jumped up and down like a kangaroo every time Taylor won a prize. "I am so proud of our school. We won something in every contest!" exclaimed Ms. Orton.

But satisfaction in the event went beyond winning. Atrisco Heritage High School freshman Alberto Ochoa stated, "The rally was one of the funnest things I have ever done. This makes me more excited than ever to do MESA."

Advisors were also upbeat about the Rally. Belen High School Advisor Alycia Gallegos, who had a team win the prosthetic arm event, said "The Rally reaffirms that all the work we do to get ready for competition is worth it. This was both worthwhile and fun."

Cibola Advisor Tammy Lara echoed the same sentiment. "I am so proud of the (Ci-

bola) kids. They did well, learned a lot and really enjoyed themselves on this perfect fall day."

The Rally competitions were a prelude to the MESA Day competitions slated for February 21 (middle school) and February 27 (high school).

Other regional activities this winter included both a high school and a middle school leadership summit (packed with student-led teachings, team-buildings and service projects), an advisors planning meeting and more than three dozen school visits. When combined with the hundreds of school activities - competition preparation, guest speakers, workshops, service learning - completed in the last three months, this has been one very productive season.

Besides upcoming MESA Day events, CO students will be participating in a series of field trips and service learning projects during the spring semester, including a legislative field trip, a "senior" field trip and MESA leadership field trip.

## \*Rally Highlight Photos\* by Rick Cole



Atrisco Heritage Academy MESA Advisor Jo Elwess watches as her students work on modifying their Alice program after completing the Alice test at the Central Outer Rally. Like most of the regional rallies, students completed an examination on their knowledge of Alice terminology and procedures before engaging in a workshop.



A student from East Mountain High School uses his prosthetic arm to move objects from one side of a table to another at the Central Inner Rally November 4 at the Albuquerque Balloon Museum.



Four Tigers from Truman Middle School collaborate on the Brain Exam at the Central Outer Rally, conducted November 7 at the Albuquerque BioPark. This team of Grace Drew, Janet Botello, Madison Calderon and Mage Niles tied for first-place in the contest with Team #1 from Taylor Middle School (Keith Reinhardt, Zita Montoya and Jordan Rowland). The Truman squad also placed second overall at the Rally scoring 534 points.

Albuquerque Biopark Curator Kathryn Venzor explains the diversity of vegetation growing in the Botanical Gardens to one group of Central Outer Rally students on the "tour" rotation. Students at the CO Rally rotated amongst three competition rounds, an aquarium tour and a botanical gardens tour/service learning project. Ideal weather for early November provided comfortable conditions for outside adventures.



"Teamwork" is how the students of Ernie Pyle Middle School worked together to rake leaves at the botanical gardens during the Central Outer Rally. Indeed, the EPMS students were so efficient in their tasks that the chief of the horticulture staff commended the students as "more productive than any college group of volunteers we've had."



# Center Inner Need Not Fear – Kimi Scheerer is Here!

**Kimi Scheerer**

*CI Region Coordinator*

Hi New Mexico MESA community... My name is Kim Scheerer and I am the NEW Central Inner Regional Coordinator! My transition onto the MESA team over the holidays has provided for some exciting and interesting STEM experiences.

I have been LOVING my site visits to different schools across the Central Inner region. The rad shirt I received from Kennedy Middle School is transitioning into a fashion masterpiece this weekend with the help of



**Scheerer-heister the  
“cheer-meister!”**

my step-daughter. I caught the gleam of shiny MESA trophies at Manzano High School. I wished for some snowball action at East Mountain High School, only brought ½ a brain to the Next Gen Academy, sat next to Chloe at Kennedy Middle School and I saw more smiles than I can count while visiting with students across the city. What a great way to kick off the New Year!

I’ve been flashing the “Michigan mitten” (ie. a palm with thumb to the east and my ‘home’ state) across town. I’ve especially enjoyed sharing my Marine Biology background with students in my neighborhood at Valley High School and learning the various mascots here around town. Go: Hornets, Monarchs, Timberwolves, Lobos (of course, that’s my new HOME turf) and the other mascots yet to be featured in this fabulous newsletter.

Amongst all this travel, I am keeping busy at my UNM Engineering Student Services-based office. Jane Nguyen, a UNM freshman and former MESA student from Volcano Vista, joins the Central Inner AND Outer regional offices as a most capable intern. Jane works three days a week, owns an axolotl (Mexican Salamander) and is the President of the UNM MESA Club. Jane’s background and MESA experience is an asset to our weekly programming, activities and statewide adventures.

Our UNM based regions (Center Inner & Outer) have also been able to connect with UNM’s Hispanics in Engineering & Sciences Organization (HESO - <http://heso.unm.edu>). If any students want to learn more about the UNM college experience, applying for college, the basics of housing or for help with tutoring... be sure to look for CI/CO joint activities and regional support with both HESO and the UNN MESA club.

Regional coordinators are available to help with campus tours and offer enthusiastic and yet practical expertise on academics, teamwork and planning for the future. It is all in the spirit of our shared passion for STEM experiences.

# NM Looking at Next Generation Science Standards

**Rick Cole**

*CO Region Coordinator*

The Next Generation Science Standards will soon be taught by this generation of science teachers. After years of development in committees at local, state and national levels, the NGSS is on the verge of implementation in many states across the nation.

New Mexico is “leaning” toward implementation but is still conducting conferences and workshops amongst educators and other educational stakeholders to determine “how” to best utilize the standards “if” they are, in fact, mandated. One such workshop took place in Albuquerque January 6-7. The workshop was hosted by the New Mexico Public Education Department and featured more than 60 attendees representing elementary, middle school and high school educators as well as representatives from more than a dozen non-profit and industry organizations.

Entitled “Understanding the Framework and Next Generation Science Standards to Guide Instruction,” the workshop focused on demonstrating ways the NGSS could be effectively utilized by educators in a variety of settings. For example, “Engaging Students in Science and Engineering Practices” and “Engaging Students in Science Performances Using Mathematics” were two of the workshops. Both revealed methods of capturing student attention and focusing student effort in understanding and applying essential scientific principles.

Attending educators were reaffirmed that their current educational pedagogy is effective. But they were also enlightened as to how student mastery of science could be effectively enriched by utilizing

NGSS instruction. Strategies and methods demonstrated are not theoretical; they are already being utilized in Utah, one state that is ahead of NM in utilizing NGSS in science education. And although relatively new to the Beehive State, preliminary test results indicate significant improvement in science understanding and performance at all grade levels moving Utah students that much further ahead of their NM counter-



**Brett Moulding, Director of the Partnership for Effective Science Teaching and Learning, has created the above diagram to demonstrate the relationships between various science and engineering processes highlighted by NGSS.**

parts.

“It is imperative that NM educators be aware of how the NGSS can assist them in making their science instruction that much more effective,” explained Lesley Galyas, Director of the Math and Science Bureau for the NMPED. “That is why we (NMPED) are hosting these workshops so that teachers can see if NGSS is truly the way they want to go.”

Although NMPED and state educators have contributed to the formation of

NGSS, no formal decision has been made to implement the framework in the Land of Enchantment. These workshops are being conducted to select educators, who then take what they have learned to their respective districts and schools, for consideration. After substantial debate, examination and modification and eventual endorsement/approval, New Mexico could adopt its own version of the NGSS in the next two to four years. That is part of the beauty of the NGSS is that it provides a framework that can be developed independently for the specific needs of individual states. For example, NM has a significant ESL population and a higher poverty rate than most states. The standards can be tailored to meet the needs of these demographics.

“I am glad to be a part of the process,” noted Margarita Smith, a National Board Certified teacher and MESA Advisor from Taylor Middle School, who is one of the APS representatives in “STEM Ready,” the NGSS examination procedure sponsored by NMPED. “NGSS is certainly good. We just need to determine how to make it fit our needs. These workshops show how NGSS can work and make for fruitful discussion.

Teachers are meeting again in February to further explore how NGSS can be implemented in NM. Another workshop will take place in late May featuring educators and education stakeholders. However, input into considering NGSS is not limited to these forums. Indeed, input on the possible implementation of NGSS is welcomed by the NMPED. Any educator or stakeholder can evaluate and then comment on the standards by accessing [nextgenscience.org](http://nextgenscience.org).

The NGSS features a three-dimension framework from which to develop state-specific standards. These often overlap with existing instructional pedagogy but are not always emphasized so that students understand their respective connections.

The framework is presented below:

## THREE DIMENSIONS OF THE FRAMEWORK

### 1. Scientific and Engineering Practices

1. Asking questions (for science) and defining problems (for engineering)
2. Developing and using models
3. Planning and carrying out investigations
4. Analyzing and interpreting data
5. Using mathematics and computational thinking
6. Constructing explanations (for science) and designing solutions (for engineering)
7. Engaging in argument from evidence
8. Obtaining, evaluating, and communicating information

### 2 Crosscutting Concepts

1. Patterns
2. Cause and effect: Mechanism and explanation
3. Scale, proportion, and quantity
4. Systems and system models
5. Energy and matter: Flows, cycles, and conservation
6. Structure and function
7. Stability and change

### 3 Disciplinary Core Ideas

#### Physical Sciences

- PS1: Matter and its interactions
- PS2: Motion and stability: Forces and interactions
- PS3: Energy
- PS4: Waves and their applications in technologies for information transfer

#### Life Sciences

- LS1: From molecules to organisms: Structures and processes
- LS2: Ecosystems: Interactions, energy, and dynamics
- LS3: Heredity: Inheritance and variation of traits
- LS4: Biological evolution: Unity and diversity

#### Earth and Space Sciences

- ESS1: Earth’s place in the universe
- ESS2: Earth’s systems
- ESS3: Earth and human activity
- Engineering, Technology, and Applications of Science
- ETS1: Engineering design
- ETS2: Links among engineering, technology, science, and society\*

\*The NGSS chart is courtesy of the National Academies Press



## Another Option of Achievement for MESA Students

**Anita Gonzales**

*Statewide Program Coordinator*

NM MESA has a new partner, The Society of Torch & Laurel. The Society of Torch & Laurel is an honor society developed by The National Society for Collegiate Scholars to recognize high school high achievers and provide them with the vital skills necessary to transition into college. One of the best things about this honor society is it's free membership. In addition to opportunities for scholarships, discounts and mentoring programs, The Society of Torch & Laurel will also spice up college application resumés! Sophomores, Juniors and Seniors are all eligible.

As a partner with NM MESA, students that are nominated to be part of TSTL are also recognized as "NM MESA students" for which there may be exclusive opportunities, such as scholarships or conferences!

All of this sounds easy enough! Now, we just need your help to get students signed up! Students can achieve any of the four following criteria to be nominated to be part of this prestigious group: 1) 1900 SAT score, 2) ACT score of 27, 3) 190 PSAT score or 4) 3.5 cumulative GPA. Again, students need to meet just ONE of the four criteria, although they don't need to limit themselves to one – go for all four!

If anyone is interested in enrolling students or needs more information on Torch & Laurel, please contact Anita Gonzales at [anita@nmmesa.org](mailto:anita@nmmesa.org) or visit <http://www.torchandlaurel.org/>.



*Photo courtesy of NSCS*

**Membership in the Society of Torch and Laurel not only provides scholarship opportunities for ambitious students but magazine subscriptions that facilitate networking with other students, colleges and other scholarship organizations.**

## Busy in the West, Preparing to Beat the Rest

**Shawndeana Smith**

*West Region Coordinator*

The West Region has been going strong since the beginning of the school year. The Fall semester was filled with fun and excitement getting the students prepared to dominate the upcoming MESA Day Competitions.

In September, the West Region hosted both Middle School and High School Leadership events at the Gallup UNM Branch as professional development for the MESA students. In November, the West Region Rally was a mini-competition and students also engaged in NMSU Grants campus activities. As the semester wound down in December, much effort was put forth to be prepared for competition in February's MESA Day event. All of this was achieved in timely fashion, in spite of several weather-related delays amongst resident schools this winter.

Service-learning projects and field trips will be the focal points of many West region MESA students as the spring semester progresses.



**Matt Solano**

## North Region is Simply Great

**Matt Solano**

*North Region Coordinator*

The NM MESA North Region, contained primarily in the foothills of the Rocky Mountains, has 14 great schools that make up the region. The schools in this region are smaller in size than many of their counterparts in other NM regions, but they make up for quantity with quality.

The schools this year have had the chance to attend the North Regional Leadership Seminar where the students participated in Leadership Activities. One of the highlights of the day was seeing the high school students work along with the middle school students and teach them about teamwork. As an observer, I was able to see leaders come out and take charge and see how other leaders take advice from younger people.

In service learning, the West Las Vegas Valley Middle School Program donated over 600 hundred cans of food to the Las Vegas Samaritan House, to help with feeding the homeless and residents of Las Vegas and surrounding communities. Other highlights from school include: West Las Vegas High working with the Elks 408 Lodge, Robertson High CYFD clothes drive, Santa Rosa High School food drive, Mora High School book drive, and many more from the other regional schools.

The North this year was able to qualify 8 students for the NM MESA SIFT (Senior Incentive Field Trip). I am happy to say that we had the second most students in the state qualify. This year we held individual Rallies at the schools that had great success in allowing the students to have more one-on-one time with yours truly, the Regional Coordinator.

I want to thank all the schools that participated in either the AMP or Oil and Gas field Trips. The students that participated in AMP got to learn about research projects that are being conducted at higher education institutions around New Mexico and see our MESA seniors that are helping with these projects. The students that participated in AMP and/or Oil and Gas got to take a tour of the Alamogordo Missile museum, White Sands Refuge, and tour the oil fields in Artesia where they learned about the industry. As a developing coordinator in MESA, I want to say with hard work and determination from the region's great advisors, we are working at making the North Region great and making creative and technically savvy students that will change the world in the future.



**Solano coordinates the Alice event.**

## SE Region "Storms" to Achievement

**Betty Chancey**

*SE Regional Coordinator*

The NM MESA Southeast Region had a very busy and exciting Fall Semester. Not only did the region receive record rainfall during the term, students also "stormed" to success in a wide variety of events.

The region hosted the third annual MESA Oil & Gas Education Fair in Artesia which continues to be an amazing event. Nearly 200 MESA students and advisors toured an oil well site, a natural gas compression facility, a hydraulic fracturing company facility and an indoor/outdoor exhibition fair at Artesia High School. This is in addition to participating in informative workshops and experiencing warm hospitality by the community.

SE schools also participated in the Best Robotics Competition, hosted by NMSU, and the NM Electric Car Challenge. They also took part in the NM Tech fieldtrips and conducted a combined Leadership Workshop with the SW Region. They staged the SE Rally with workshops on Agriculture in the Classroom, Water Conservation & Aquifers and MESA Day Event Competitions. Schools were also working on the NMSU Innventure competition and Science Olympiad events. They will soon compete in the Spring State competitions for these two events.

SE Region schools worked with the city of Roswell in hosting the "Robert H. Goddard – Aiming for the Stars" Festival, a celebration of Goddard's contributions to Space Exploration. SE MESA students manned two MESA tables which provided demonstrations for the public allowing kids and adults to try out Berrendo Middle School's flight simulator received from the Civil Air Patrol, robots, cars powered by electric, hydrogen and rubber band energy, small trebuchets and other projects they had worked on in their MESA programs. They also manned booths for the VLA Portable Planetarium booth, three NASA Exhibits and helped guide visitors through various events at the Festival. The MESA tables received as much attention as the other great exhibits at this event. It was a great way to showcase NM MESA and its wonderful students!!!

## Prosthetics is More Than a Competition

**Terry Ramirez**

*SW Region Coordinator*



*Photo by Terry Ramirez*

**Utilizing his prosthetic arm for MESA Day, CC Snell Middle School student Robert Montoya presents a donation check to Trevor Bergman of LIMBS International. Also in the picture are club advisor Cindy Lee and the rest of the team.**

On December 6th, 2014 at the Southwest Regional Rally, students from C.C. Snell Middle School in Bayard, NM presented Trevor Berman, Executive Director of LIMBS International, with a \$600.00 check to kick off the Southwest Region's Service Learning Project for the 2014-2015 School year.

LIMBS International works with third-world countries across the globe to provide durable yet inexpensive prosthetics to amputees or those born with incomplete limbs. Each leg costs only \$300.00 and all proceeds donated to LIMBS go towards funding limb manufacturing and delivery! The SW Region's goal is to raise enough

funds for 30 legs by the end of the school year.

As a part of this service learning project, students were educated about real world problems, such as the life of an amputee and how this year's project for MESA Day, "Prosthetic Arm," can impact real people. For more information or to get involved with LIMBS, please contact any NM MESA Regional Coordinator.

Besides great service learning, students in the SW region participated in a variety of activities this fall and winter, including a competitive rally, college visits, field trips and leadership development. The spring will include more STEM activities.

## VISION

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