

Horizons

Expanding Horizons in Science, Technology, Engineering, and Mathematics
Sponsored by the National Science Foundation

Resilience, a Key Quality for STEM Students and Programs

New Mexico Alliance for Minority Participation (NM AMP) students, staff, and programs are not only surviving but thriving in the coronavirus pandemic. Over the last several months, NM AMP has held a Governing Board Meeting, conferred with Institutional Coordinators, collected information from outstanding alumni, developed an internship for Summer 2020, and continued to work with up-and-coming STEM researchers. Additionally, NM AMP has developed three new programs: STEM PREP, the Book Stipend Award, and the Student Advisory Board. NM AMP is encouraging research projects and internships that address the COVID-19 pandemic and other global issues.

Getting on the Same Page: Institutional Coordinators Meet in Albuquerque

On Friday, March 6, 2020, Institutional Coordinators (ICs) from across the state gathered in Albuquerque, NM, to discuss the state of the current program and to brainstorm ideas to improve the alliance. Dr. King, NM AMP Director, moderated the meeting in which the morning was dedicated to the reflection of the alliance's current practices, and the afternoon was a team-based approach to harvesting ideas that will improve the programs.

Jeanne Garland discussed the programmatic changes and how best to run the existing and new programs and activities. She also encouraged the ICs to collaborate with their Institutional Analysis Offices and Registrar's Offices to gather information for the "NSF's National Extraordinary LSAMP Scholars: Trailblazers and Innovators" publication to coincide with NSF's 70th anniversary. This publication will focus on students from each LSAMP who have earned terminal degrees in their fields. Therefore, the ICs were requested to search for and track students from their programs to contribute to the publication. NM AMP reported 50 students who had received such terminal degrees as the Ph.D., the M.D., and others, including important information and a photo of every student reported. WebAMP in the Canvas venue was discussed, with a thorough explanation of best ways to complete it and what to include.

Next, Dr. Michelle Bloodworth of Insight Allies, who serves



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as the program External Evaluator, presented her results from her evaluation of the Undergraduate Research Scholars (URS)



program and the statewide nature of the alliance. Dr. Bloodworth facilitated a team-based session in which the ICs were split into four groups to rotate around tables to address topics including SCCORE recruitment, conference recruitment best practices, URS recruitment, and innovations at 2-year institutions. The ICs worked together to consider challenges, solutions, and strategies to implement the solutions. By introducing the previous groups' work on the topic, it led the ICs to think creatively about the topics. The session resulted in many action items for the alliance to consider for program improvement.

An intriguing presentation with many valuable insights and updates on the study regarding students' research identity was led by Dr. Stephanie Arnett, NMSU Sociology Assoc. Professor, who serves on the Social Science Research Study Team for NM AMP. Dr. Gaspard Mucundanyi, NM AMP Database Analyst, gave a presentation about data management systems used to collect, manage, and report data using RedCap, TTracker, and PowerBI.

New Mexico Higher Education Leaders Gather for Governing Board Meeting

Leaders from NM AMP Partner Institutions from across the state gathered at the New Mexico State University-Main Campus in Las Cruces, NM, on January 10, 2020, to bridge the gaps between institutions and the alliance. Dr. John D. Floros, NMSU President, and NM AMP Principal Investigator, along with Dr. J. Phillip King, NM AMP Director and NMSU Civil Engineering

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A Message from the Director, Dr. J. Phillip King

Although this has been a very unique and painful time in our country's history, resulting in many diverse challenges for NM AMP, we have continued to plan, develop, and deliver engaging opportunities in Science, Technology, Engineering, and Mathematics (STEM) for our

statewide participants. COVID-19, a formidable adversary, has forced us to prove our skill and determination to succeed, and our Institutional Coordinators (ICs), staff, and administrators have stepped up to complete our Spring 2020 programs and to continue to work together as a team to plan for the future. Our numbers have held steady in our programs, and we are planning on seeing the programs flourish in Fall 2020, including the Undergraduate Research Scholars and STEM PREP programs, the Book Award Stipend, the Transfer Stipend Award, and the Student Advisory Board representation from seven of our partner institutions. We are also excited about the all the possibilities we see for a Virtual NM AMP Student Research Conference on October 9, 2020. We know that many of our plans depend on the COVID situation, but whether in person, via Zoom online, or in a hybrid method, we will continue to increase our numbers of underrepresented minority (URM) students in our programs, leading to retention, transfer, and progression to graduate school.

Although COVID did not allow us to host SCCORE at our universities in Summer 2020, we did collaborate with the University of Colorado Boulder to fund an internship, the NMAMPPE at Santa Fe Community College, one of our partner institutions, that focused on the design and 3D printing of Personal Protective Equipment (PPE) to distribute to the Pueblos and the Navajo Nation. In addition, SFCC's STEM Core Club "Operation Bandana" is currently working on a project to make

cloth masks for this same population with their own funding and funding from the Robotics Club. We thank Miguel Maestas, SFCC's IC, Coordinator/Instructor, and PI of this internship for his hard work.

NM AMP held the Governing Board Meeting for our partner institutions' administrators in January, 2020, and our staff, administrators, and ICs met in Albuquerque in early March. Our funding agency, National Science Foundation, assigned each LSAMP over ten years to track 50 students who had successfully completed the terminal degree for their discipline. Our ICs and staff took on this assignment with determination, and we submitted information about 50 of our statewide students. Our contribution will be added to the write-ups of other LSAMP's successful students as part of a larger publication to be disseminated.

Our Social Science Team of faculty experts continued the Social Science/Educational Research component to study factors that impact scientific identity of engineering and other students in STEM. In Year 3, they plan to collect one or more baseline cohort studies and continue to administer follow-up surveys. They also plan to collect achievement/enrollment data for Cohorts 1-3 and to use a propensity score analysis to test for program effects and follow-up data to construct/test our longitudinal models. In Year 3, we also plan to hold a Context Diversity Workshop for faculty at NMSU.

We have many plans and a team of hard-working ICs and staff members to see these plans to fruition. With much to celebrate, we are making progress toward another year of success in which we offer programs, events, and activities that lead to retention and progression for URM students statewide. At last count in 2018-19, the percentage of URMs who earned B.S. degrees was 51% (N=947), and we look forward to seeing more increase this coming academic year!

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Professor & Associate Department Head, welcomed the board and facilitated the morning meeting discussions.

Dr. Gaspard Mucundanyi, NM AMP Database Analyst, presented updates on the data collection, management, and reporting using REDCap, TTracker, and PowerBI applications with an emphasis on improving data resolution and quality by leveraging the partner institutions' data analysis offices.

An update on the Social Science research component, required by National Science Foundation (NSF) for NM AMP and other alliances over ten years, was led by Dr. Sandra Way, NMSU Sociology Professor and Social Science Lead for NM AMP. This study investigates the engineering and science identity development

and the role it plays in postsecondary students' commitment to the disciplines and educational persistence. Dr. Way discussed some preliminary results indicating significant differences in scientific and engineering identities across genders and minorities.

The governing board also listened to Jeanne Garland, NM AMP Associate Director, discuss the new phase, STEM Pathways for Research Alliance (SPRA) that is comprised of alliances established at least ten years ago. In this phase of the NM AMP program in its 27th year, existing programs include URS, IREP, SCORE, Transfer Stipend, and the NM AMP Student Research Conference. This phase also includes our new value-added programs, including STEM PREP, the Book Stipend, and the Student Advisory Board. Ms. Garland also informed the Governing Board about the 2019 SPRA Conference held in May 2019 at NMSU for all programs over ten years. Twelve alliances gathered in Las Cruces in May 2019 for

a SPRA Conference. A proposal is currently under discussion with the Louis Stokes Midwest Regional Center of Excellence (LSMRCE) to hold a larger SPRA Alliance Conference in the future as a venue for the social science experts from each program to progress on their research studies.

People, Places, and Things



John Reese, San Juan College
Institutional Coordinator

Welcome to **John Reese**, San Juan College (SJC) Biology Instructor, as the new Institutional Coordinator (IC) at SJC. Mr. Reese earned the Bachelor's of Science Degree in Biology from Moravian College located in his hometown of Bethlehem, PA and then earned his Master's of Science Degree in Ecology and Evolutionary Biology at the University of Tennessee in Knoxville, TN. Mr. Reese is looking forward to working with NM AMP to promote equity in undergraduate research. John Reese is replacing **Jonathan Tsosie**, the former SJC IC. Inspired by working as an Advanced Emergency Medical Technician during the COVID-19 pandemic, Mr. Tsosie is resigning from his SJC position to study infectious diseases in medical school. As a former NM AMP undergraduate student, Mr. Tsosie was glad to extend the connection to other underrepresented students in the first year of the NM AMP Program at SJC. Jonathan is confident that John will bring enthusiasm to the program and excel as the new IC!

NM AMP collaborated on an internship entitled the New Mexico Advanced Manufacturing Personal Protective Equipment (NMAMPPE) Internship Project at Santa Fe Community College (SFCC). This project is collaboratively funded by NM AMP, Growth Sector, and the University of Colorado Boulder through a NSF INCLUDES alliance project. Students are performing the course work and design work from home, using 3-D printers available to them for PPE to be disseminated to the Navajo Nation, the Pueblos and others of high-need and low-access to PPE. The students will take a credit-bearing course to provide training. Interns for the NMAMPPE include STEM students



**A m a n d a
Barela, Yuliia
Trujillo, Karina
Ornelas, Jeremy
Sanchez, and
Sara Lanctot.**



NMAMPPE interns wear PPE they designed and printed

Dr. King and Ms. Garland concluded the Governing Board Meeting with a discussion of the importance of leveraging AMP resources at their institutions, and how to proceed on a mutually beneficial path, especially regarding shared program data.



Abigail Axness at Valles Caldera

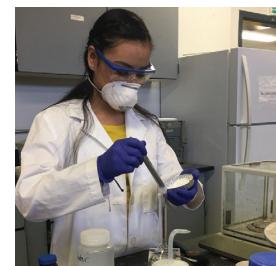
In addition, the SFCC STEM Core Club is making cloth masks with their own funding and funding from the SFCC Robotics Club. These masks will also be distributed to meet the needs of the Navajo Nation and Pueblo people.

Student News:

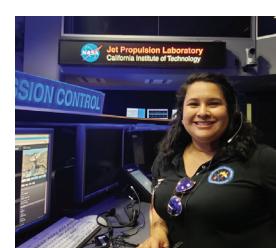
Abigail Axness, a URS student at University of New Mexico, will be receiving the Bachelor's of Science degree in Geology this Summer and will continue her studies this Fall at Boise State University. She has accepted a NM AMP Bridge to the Doctorate (BD) fellowship to pursue a graduate degree in Geology and will focus her research on fire mitigation, community involvement, and climate change. As an undergraduate student, Abigail participated in a research project studying the importance of maintaining water quality sensors within the Valles Caldera National Preserve under her Faculty Mentor Dr. Laura Crossey. These sensors monitor the overall health of the water supply present at the Valles Caldera. Abigail presented a poster at the Geological Society of America's Fall 2019 meeting detailing her involvement in her research.

Andrea Loya Lujan, a 2019 SCCORE participant, is the Spring 2020 Science, Engineering, and Mathematics Division Plus Award Winner at Doña Ana Community College of the New Mexico State System. She is currently a member of the Phi Eta Sigma Honor Society and is a Crimson Scholar. While attending DACC, Andrea has worked as a Peer Tutor in Mathematics and Chemistry at the Academic Readiness Center on the DACC Espina Campus. During her time in SCCORE in which she participated at NMSU, Andrea conducted research that focused on finding potential solutions to selenium and arsenic oxyanions migration from mining sites to groundwater. This research has the potential to help mitigate an environmental risk associated with mining. Andrea plans to transfer from DACC to New Mexico State University in Fall 2020 to continue her studies.

Bianca Serda graduated from the University of New Mexico this Spring with the Bachelor's of Science in Biology degree. Bianca started in NM AMP programs at Central New Mexico Community College (CNM), participating in the SCCORE program hosted by UNM. She worked with Dr. David Hanson in the Biology Department at UNM, researching Chlorella sorokiniana, a microalga. Bianca transferred to UNM from CNM in Fall 2017 and was able to continue working with Dr. Hanson through the NM AMP URS program. She represented UNM on the NM AMP



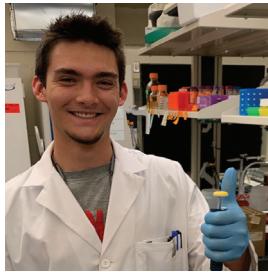
Andrea Loya Lujan
working in the laboratory



Bianca Serda visits the
NASA Jet Propulsion Laboratory



*Christopher Gallegos
working with research samples*



*Cielo Gonzalez Kirkpatrick
works with bacterial cells*



Francisco Gonzalez



*Megan Begay using water quality
analysis equipment*



Rachel Ridgeway

Student Advisory Board for 2019-2020. In addition to AMP programs, Bianca accepted a National Institutes of Health (NIH) Maximizing Access to Research Careers (MARC) fellowship that funds research and professional development. Bianca has also served as a Research Associate in the NASA Space Life Science Training Program at Ames Research Center and is an active member of the Student Board of the American Society of Gravitational and Space Research.

URS student **Christopher Gallegos** from the University of New Mexico is a rising junior earning the Bachelor's of Science in Biology. Christopher has been working on a research project that examines the effect of UV-C light on microorganisms in caves present at three national parks in California, Oregon, and Kentucky. This research project has potential implications in how to control White Nose Syndrome outbreaks that is caused by a fungus in hibernating bat populations. Christopher also participates in the UNM Trailblazers in which he represents UNM to the greater alumni network of UNM. Christopher plans to pursue a Master's and Ph.D. in Microbiology to study infectious diseases and improve antiviral medications. Christopher Gallegos is working under his Faculty Mentor, Dr. Diana Northup.

Cielo Gonzales Kirkpatrick is a successful Junior Chemical Engineering student at the University of New Mexico. Cielo is currently participating in a research project that aims to find ways to reliably synthesize ribosomally synthesized and post-translationally modified peptides (RiPPs). The project, led by Faculty Mentor Dr. Mark Walker, is exploring and developing methods to isolate and biosynthesize active enzymes with bacterial cells that will modify small peptide chains and result in RiPPs. The results of this project can have larger implications in the medical community and can open a pathway to further pharmaceutical discovery. Cielo presented his research at the 2019 Annual NM AMP conference in Las Cruces last year.

Cielo was elected Vice President of the UNM American Institute of Chemical Engineers (AIChE) at the end of the Spring semester. He will serve as the Vice President for the 2020-2021 school year and the President for the 2021-2022 school year. Cielo is also interested in pursuing a Ph.D. in engineering upon completion of his undergraduate degree and has taken the first steps in looking into graduate programs. Cielo would like to thank the NM AMP program for allowing

him this research opportunity as a student and opening the door to a future career as a researcher.

Francisco Gonzalez is a Mechanical Engineering student at New Mexico Institute of Mining and

Technology where he is the team lead on a project for the Owens Corning company as part of the URS program. This research and development project aims to improve upon an existing design of L-shaped lugs that are used within the manufacturing plant. Francisco and his team are working to incorporate a functionality within the lugs that will prevent the overtightening of the lugs when they are installed within the manufacturing plant. This project has been presented at the New Mexico Tech Student Research Symposium and will continue into the Fall semester.

Francisco also balances a year-round internship at Sandia National Laboratories, where he is a research and development undergraduate intern. Francisco plans to apply to the University of Texas at Austin and pursue the Master's of Science in Mechanical Engineering. He plans to focus his research on manufacturing and design engineering so that he may understand how thoughtful and comprehensive designs come to life in industry. Francisco has been a part of the NM AMP URS program since 2018 and is currently under the faculty mentorship of Dr. Michael Hargather.

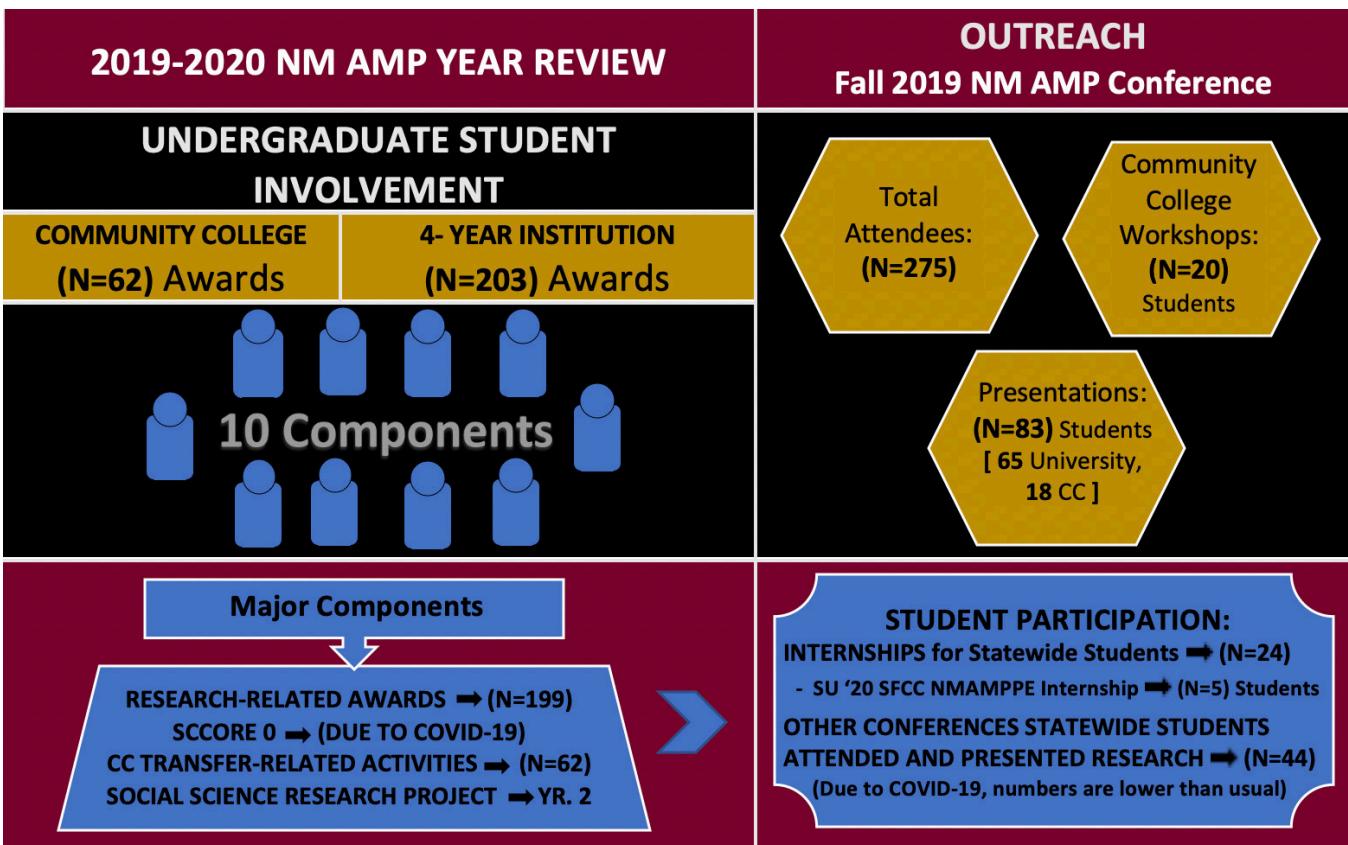
Megan Begay is a URS participant and a Senior studying Environmental Geology at New Mexico Highlands University. This past Spring, she participated in a water quality analysis study of the Upper Pecos River under the faculty mentorship of Dr. Jennifer Lindline of the Natural Resources Management Department at NMHU. The water quality analysis team has published an abstract detailing the research conducted thus far in the 17th Annual New Mexico Highlands University Faculty and Student Research and Creative Showcase Day Program. Megan is continuing her study of the Upper Pecos River through the NSF-funded Partnership for Research and Education in Materials (PREM) program this summer. Megan is collecting and analyzing water quality data of the Upper Pecos River for this PREM project.

Rachel Ridgeway, STEM AMP Alumna, was recently selected for the highly competitive NSF Graduate Research Fellowships Program (GRFP). Rachel is transitioning from the University of Alabama to the University of New Mexico in Fall 2020 to complete her Ph.D. through the Nanoscience and Microsystems Engineering Program. At the University of Alabama, she worked in the Hauser Research Group in the physics department. At UNM, Rachel will be working with Dr. David Hanson (Biology) to study the chemical and metabolic properties of plant tissue by observing electrical impedance changes. Formerly, she participated in the SCCORE program for two years at NMSU as a Luna CC student, working with Dr. Jacob Urquidi in the X-Ray Neutron Science (XNS) lab in the NMSU Physics Department. Rachel continued to work there throughout her undergraduate physics studies until she received the Bachelor's of Science in Physics from NMSU. She is the recipient of the STEM AMP Transfer and URS Stipends, and she served as Student Assistant in the STEM AMP office and as Student Instructor for the credit-bearing course in SCCORE for two years.

Save the Date

NMAMP Virtual Research Conference to be held October 9th, 2020

Please join us on Friday, October 9, 2020 via videoconferencing for our annual Undergraduate Student Research Conference! As more details become available, they will be published at <https://nmampconf.nmsu.edu/>



Graduating and Transfer Students

New Mexico State University:
 Elijah J. Barrio-Moya
 Ethan J. Billingsley
 LaPorsha Campbell
 Gabrielle Carrillo
 Oscar Gallegos
 Toteona Gray
 Marlie Maestas
 Rebecca Melendez
 Melissa Aguirre
 Alexandra Alvarez
 Fernando Alvidrez
 Pascual Camacho
 Adan Campos
 Jocelyne Chavez
 Carlos Estrada
 Isabel Fernandez

Ericka Flores
 Virginia Fuentes
 Elizabeth Hall
 Esai Lopez
 Priscyla Marquez
 Jose Melendez
 Camila Merjil
 Alan Moya
 Juan Olivares
 Cristina Onsurez
 Alberto Orduno
 Jonathan Ortiz
 Ryan Quintana
 Jackelyn Rocha
 Felicia Rodriguez
 Kathrine Sweebe
 Auburn Tolcannya
 Juan Treto

Eastern New Mexico University
 Laura Ponce
 Cristina Salazar-Guerrero
 Haily Galindo

New Mexico Highlands University
 Saige Martinez
 Renee Hernandez
 Faurie Pascal
 Tenorio Nikita

New Mexico Institute of Mining and Technology
 Brianna Green
 Melissa Montoya
 Francisco J. Gonzalez-

Castillo
 Mercedes Salazar
 Magdelyn Rich
 Anastasiya Hamdi

Northern New Mexico College
 Levi Albert
 James McKeough
 Cristian Nevarez-Caraveo
 Megan N. Osmus

University of New Mexico
 Diego Trujillo
 Shania Sanchez
 William Briggs
 Keila Gutierrez
 Bethehem Hailu

Kelsie Herzer
 Nuha Islam
 Jarett Jones
 Frank A. Kouzel-Martinez
 Cassandra Lujan
 Alissa Perea
 Jasmine Quiambao
 Jaeden R. Sandoval
 Bianca Serda
 Gemma I. Strong
 Jackie Tafoya
 Abigail A. Walraven-Axness

Western New Mexico University
 Kaissa Duran
 Brenda Dominguez
 Andrea Victor

Transferring Community College Students

Central New Mexico Community College

FALL 2019
 Andre Ortiz – to NM Tech
 Ashley Edenfield – to NMHU

SPRING 2020
 Leroy Valencia – to UNM
 Juan Zubia – to UNM

Luna Community College

FALL 2019
 Santiago Esquivel – to NM Tech
 Nicholas Maestas – to NM Tech
 Justin Valdez – to NM Tech
 Saige Martinez – to NMHU

New Mexico State University-Alamogordo

FALL 2019
 Trever Perkins – to NMSU
 Julian McPherson – to NM Tech

New Mexico State University-Carlsbad

FALL 2019
 Holly Meadows – to NMSU
 Dion Reid – to NMSU

SPRING 2020
 Teighan Sanchez – to NMSU

Doña Ana Community College

FALL 2019
 Jennifer Allen – to NMSU
 Ashton Gorzelski – to NMSU

SPRING 2020
 Alfred Flores – to NMSU

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