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CO-AMP Impact Report:

20 Years of Changing Students' Lives Through Quality STEM Education in Colorado

2015



*Made possible through a grant from the National Science Foundation:
HRD-1102523*



THE LOUIS STOKES COLORADO ALLIANCE FOR MINORITY PARTICIPATION: **20th YEAR IMPACT REPORT**

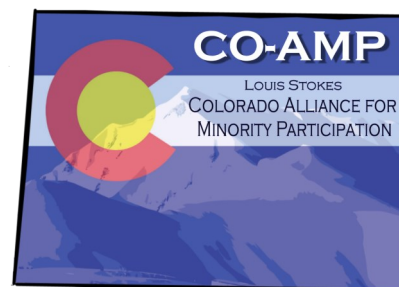
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FOREWORD

The Louis Stokes Colorado Alliance for Minority Participation (CO-AMP) is proud to be an innovative consortium of fifteen Colorado institutions of higher education as part of the National Science Foundation's framework of colleges and universities that comprise the LS-AMP network. Since its inception in 1995, CO-AMP has built upon its past successes of collaborative programs and activities, systems experience, and record of institutionalization to utilize strategies identified as best practices that recruit, retain, and provide educational experiences for underrepresented minority (URM) students graduating with baccalaureate degrees in STEM fields. CO-AMP has continued to focus on increasing the URM student pipeline while integrating education and research to yield new knowledge, innovations and models for broadening the participation of URM groups in STEM and the STEM workforce.



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This impact report begins with the Executive Summary that profiles our program with its history, accomplishments and statistical review over the past nineteen years. The following sections spotlight each of our institutions, including a new partner, the University of Denver. For each partner, a section is devoted to the institution, a senior staff member, and an outstanding student or student activity. The report also highlights CO-AMP leadership, Bridge to the Doctorate Fellows, international connections, and CO-AMP conference speakers who have all graciously contributed their expertise and professional experiences to CO-AMP.

It is with great pleasure that we share "CO-AMP Impact Report: 20 Years of Changing Students' Lives Through Quality STEM Education in Colorado," highlighting some of our accomplishments and the impact that has been felt, not only state-wide, but across the country and around the world. Although it is impossible to feature every success, it is our hope that this publication will serve as a resource, as well as a tribute, to our growing alliance of dedicated individuals. Please enjoy this glance backwards at CO-AMP's achievements, and then join us as we look to the future!

Dr. Rick Miranda
Colorado State University
Provost & Executive Vice-President
CO-AMP PI

Dr. Ernest Chavez
Colorado State University
Professor
CO-AMP Director and Co-PI

CO-AMP staff and partners would like to thank the National Science Foundation—Dr. A. James Hicks, Dr. Tasha R. Inniss, Ms. Martha James, and Mr. Maurice Dues for their continued support.

LEVERAGING STRATEGIES

It is now more important than ever for institutions and organizations to join forces in supporting the needs of URM students in STEM. In response, and partly driven by economic necessity, CO-AMP has employed innovative strategies for collaborating and securing additional funding and cooperative capacity. For example, CO-AMP has connected with the University of Colorado System (CU-B, UCCS, CU-D) to create an inventory (called ImPACT) of every URM STEM pipeline program that is active across the University of Colorado System (all CO-AMP institutions will soon become part of the inventory). ImPACT will be an exhaustive list of programs, including those focused on outreach. This is a necessary first step in achieving the vision of becoming an integrated network that leverages information and support throughout Colorado.

In 2014, CO-AMP secured additional funding support through a B2B (NIH) grant by partnering with Front Range Community College in an effort to increase community college transfer rates. The B2B grant proposal was an offshoot of an earlier effort to remove a barrier for students transferring into biochemistry and biology at Colorado State University. Even though Front Range was not a CO-AMP partner, their prerequisite requirements were assessed and twenty-one URM STEM students ultimately transferred to Colorado State University.

CO-AMP has recently coordinated with Research Experiences for Undergraduates and Engineers Without Borders at partner institutions to grow and enhance research and international experiences to bring efficiency to scale as we communicate between institutions and work collaboratively. In the interest of developing other international opportunities, CO-AMP is currently creating a partnership with the Posner Center in Denver.

The National Renewable Energy Laboratory (NREL) in Golden, CO, hosted the 2015 CO-AMP Spring Meeting, and brought together site coordinators from fifteen partner sites, along with CO-AMP students to discuss opportunities in STEM careers. Through this meeting, presentations made by an industry panel featuring representatives from Boeing, Lockheed Martin, and NREL created connections for internships and advanced industry-institutional relationships. And last, but certainly not least, CO-AMP has continued to seek out and apply to numerous endowment and private foundation sources to enhance our institutional structure and outreach.

CO-AMP Industry Partners



EXECUTIVE SUMMARY

The following Impact Report gives a preview into CO-AMP's extensive history of expanding participation at partner sites, with a record of significant achievements. During the last nineteen years of quantifiable successes, the LSAMP program in Colorado has significantly impacted participants to make profound changes in their academic careers and lives. Since its inception, CO-AMP has established numerous programs and activities at partner institutions that have now institutionalized those initiatives. As a result, CO-AMP partners have achieved a high-level of systemic change for underrepresented STEM students in Colorado.



What may not be as evident in this report is the emphasis CO-AMP has continued to place on evaluation of math skill-building programs and its efforts to determine which of those programs are most effective and best prepare students for advanced level mathematics. As reported previously, CO-AMP developed a Problems-Based Learning Intervention study to address and enhance future program delivery and evaluation at partner sites. Through the development of the Study, conducted at Colorado State University (lead institution), those research findings have continued to be utilized to strengthen the continuation of learning community structures. As a direct outcome of a CO-AMP two-day conference and conveyance of results from the intervention study, Colorado School of Mines offered a Themed Learning Community in fall 2015. A paper titled "Impact of living-learning communities on college algebra" which summarizes the results of the Problems-Based Learning Intervention appears in the *Learning Communities Journal*. CO-AMP continues to consider the goal of providing evidence-based recommendations for building successful math skill building programs as a paramount goal for our partners' futures.

During the last nineteen years of quantifiable successes, the LSAMP program in Colorado (CO-AMP) has significantly impacted participants to make profound changes in their academic careers and lives.

ECONOMIC IMPACT

CO-AMP's mission, to serve underrepresented students in STEM fields, has had a varied focus over the past twenty years. When CO-AMP initially received NSF funding in 1995, it worked to build a robust infrastructure with partner institutions. From that beginning point, it strived for collaboration, integration, and enhancement of existing programs. Today, CO-AMP is an innovative consortium with state-of-the-art programs that enroll and graduate underrepresented minority students, while taking a research approach to further reduce our attrition rates by developing and building students' capacity in both math competency and scientific identity.

In one critical aspect, our mission to serve students, remains constant. CO-AMP, throughout its history, has been dedicated to academic vitality as demonstrated by clear and measurable examples of our accomplishments (see figures 1-3, page 9). But CO-AMP's commitment can also be seen in ways that are less concrete but equally significant – in the enrichment of student's lives. This segment from a letter written by a CO-AMP student to a site coordinator says it all, "...I found someone who would show me that the only thing that could limit my life was the size of my determination. And so, even though I believed I would never be good at math, I was able to accomplish what I never thought possible...the calculus series. Thank you for believing in me when I didn't believe in myself." On this last point, CO-AMP's contribution to students is immeasurable, as our graduates stand proud of their accomplishments on graduation day.

The impact of higher education is also felt throughout Colorado in economic terms. For instance, median earnings of bachelor's degree recipients with no advanced degree working full time in 2011 were \$56,500, \$21,100 more than median earnings of high school graduates. Individuals with some college but no degree earned 14% more than high school graduates working full time. As workers age, earnings rise more rapidly for those with higher levels of education. For example, the gap between the earnings of full-time workers whose highest degree is a bachelor's degree and those of high school graduates grows from 54% (\$15,200) for 25- to 29-year-olds to 86% (\$32,000) for 45- to 49-year-olds. If Hispanics/Latinos, African-Americans, and Native Americans achieved the same levels of education as Whites by 2020, Colorado's personal income would increase by \$5.2 Billion (in 2000 dollars). Federal, state, and local governments also enjoy increased tax revenues from college graduates and spend less on income-support programs for them, providing a direct financial return on investments in postsecondary education. The extent to which the income effects of a college degree exceed their private returns can be thought of as an "educational spillover." Growth in the college-educated workforce "spills over" to other sectors, increasing the productivity of all workers. With rising productivity, wages increase for workers of all education levels. Thus, the benefits of individual higher education extend across society.

Perhaps the most important purpose of this report, then, is to demonstrate the value of CO-AMP and the need for continued growth as we look to build cultural awareness and understanding as preparation for an economically competitive, globally engaged workforce of future generations.

CO-AMP LEADERSHIP 2015



Dr. Tony Frank
Chair, Governing Board
2008 — present



Dr. Rick Miranda
PI
2008 — present



Dr. Ernest Chavez
Co-PI and Director
2008 — present



Mr. David Aragon
Management Team
1996 — present



Dr. Renee Beeton
Management Team
2014 — present



Dr. Beverly Marquart
Program Manager
2007 — present



Dr. Don May
Data Manager
1996 — present



Dr. Rose Shaw
Evaluator
1996 — present



Dr. Cheryl Beseler
Research Coordinator
2010 — present



Ms. Erin Whipple
Program Support Coordinator
2009 — present

CO-AMP GOVERNING BOARD



Dr. Beverlee McClure, President
Adams State University



Dr. Leah Bornstein, President
Aims Community College



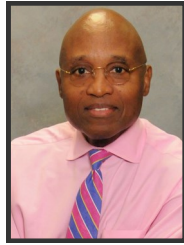
Dr. Paul Johnson, President
Colorado School of Mines



Dr. Tony Frank, Chancellor
Colorado State University System
President, Colorado State University



Dr. Lesley Di Mare, President
Colorado State University — Pueblo



Dr. Everette J. Freeman,
President
Community College of Denver



Dr. Dene Kay Thomas,
President
Fort Lewis College



Dr. Stephen M. Jordan, President
Metropolitan State University
of Denver



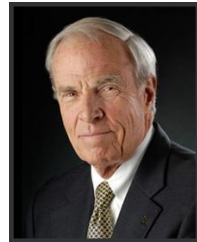
Jay Lee, J.D., President
Northeastern Junior College



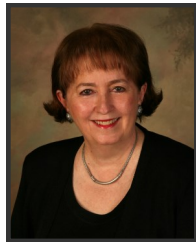
Mr. James T. Rizzuto,
President
Otero Junior College



Dr. Carmen Simone,
President
Trinidad State Junior College



Mr. Bruce D. Benson,
President
University of Colorado
System



Dr. Pamela Shockley-Zalabak, Chancellor
University of Colorado -
Colorado Springs



Dr. Jerry Wartgow,
Chancellor
University of Colorado -
Denver



Dr. Rebecca Chopp,
Chancellor
University of Denver

INTRODUCTION

The Louis Stokes Colorado Alliance for Minority Participation (LS CO-AMP) comprises fifteen institutions of higher education, which includes the following partners:

Research-intensive universities: Colorado State University (Lead Institution) and University of Colorado Boulder

High research universities: Colorado School of Mines, University of Colorado Colorado Springs, University of Colorado Denver, and University of Denver

Comprehensive universities: Adams State University, Colorado State University-Pueblo, Metropolitan State University of Denver

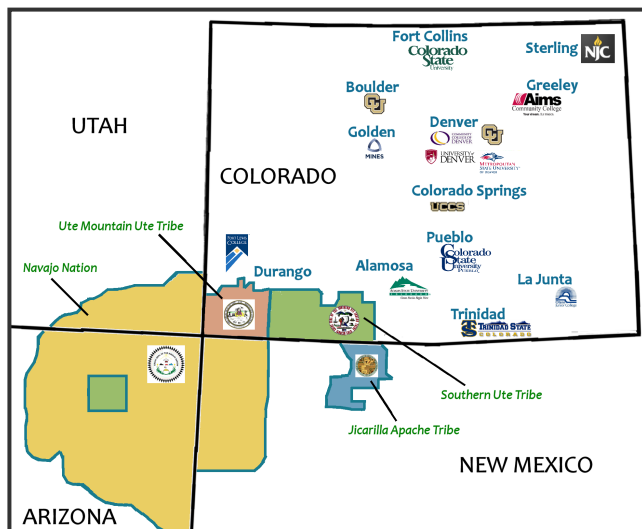
Liberal Arts College: Fort Lewis College

Community Colleges: Aims Community College, Community College of Denver, Northeastern Junior College, Otero Junior College, and Trinidad State Junior College

Minority-serving institutions: Adams State University (HSI), Aims Community College (HSI), Colorado State University-Pueblo (HSI), Community College of Denver (HSI), Fort Lewis College (Native American-Serving, Non-Tribal Institution), Otero Junior College (HSI), and Trinidad State Junior College (HSI)

CO-AMP also partners with four tribes (**Jicarilla Apache**, **Navajo**, **Southern Ute**, and **Ute Mountain Ute**), along with partners from numerous corporations, governmental agencies, and professional organizations. These partnerships and collaborations continue to provide insight into the ever-changing direction of technology and offer career opportunities and internships to underrepresented minority students.

As illustrated in tables on the following page, CO-AMP has greatly increased the number of students earning STEM degrees since 1995.



In Memoriam: Louis Stokes 1925-2015

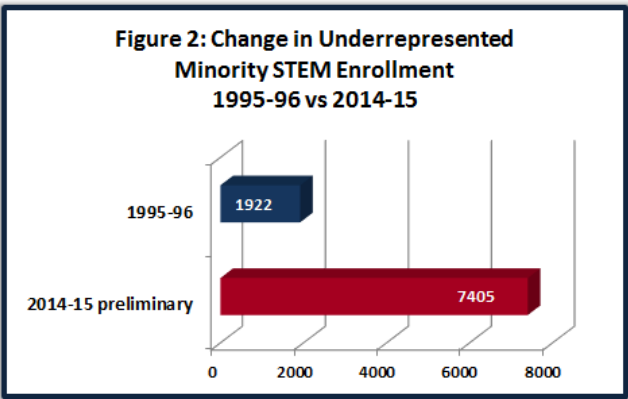
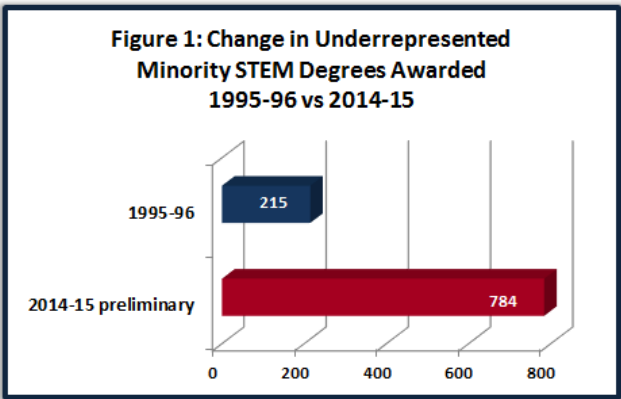
Louis Stokes served and defended those who were unable to do so for themselves. His passion and commitment gave birth to the Louis Stokes Alliance for Minority Participation program and played a critical role in the advancement for social and economic justice, civil rights and equality. We acknowledge and thank Mr. Stokes for the lasting legacy of LSAMP.



ACCOMPLISHMENTS

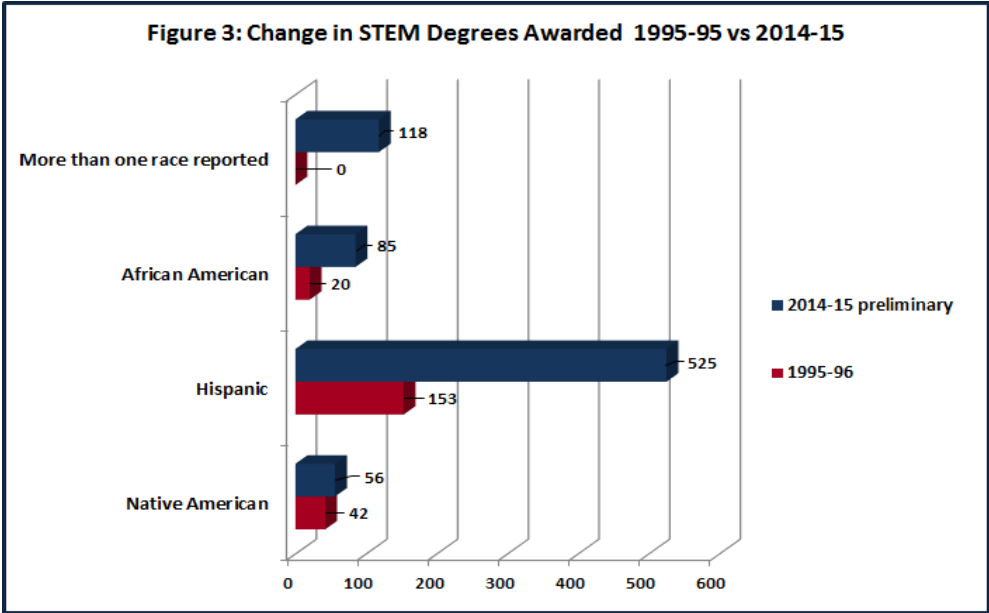
CO-AMP REPORT CARD SINCE 1995-96:

- 265% Increase in UREP STEM degrees awarded
- 285% Increase in UREP undergraduate minority STEM enrollment



STEM B.S. degrees awarded to CO-AMP students since 1995-96 by ethnic breakdown:

- 325% Increase in number of African American students graduating in STEM fields
- 243% Increase in number of Hispanic students graduating in STEM fields
- 33% Increase in number of Native American students graduating in STEM fields

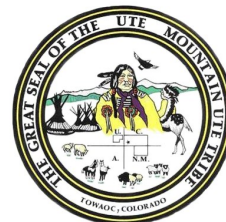


Source: WebAMP (<http://www.lsamp.org>)

Note: 2014-15 data is preliminary and may change when data is finalized.

CO-AMP TRIBAL PARTNERS

Ute Mountain Ute – Towaoc, Colorado: the Ute Mountain Ute Reservation is located on 597,000 acres in southwest Colorado, southeast Utah, and northern New Mexico. This region is known as the Colorado Plateau, a high desert with deep canyons in the Four Corners region. The first piped drinking water was brought to the Ute community in 1988. Today, the Tribe employs 900 people in its various enterprises and departmental programs, making it the second largest employer in the Four Corners area. In cooperation with the Ute Mountain Ute Education Department and other organizations, the Tribe has developed and implemented numerous educational programs related to environmental issues.



Jicarilla Apache – Dulce, New Mexico: the Jicarilla Apache Nation is located in the mountains and rugged mesas of northern New Mexico near the Colorado border. The reservation sits on the San Juan Basin, which is rich in fossil fuels, and is the largest producer of oil along the Rocky Mountains and the second largest producer of natural gas in the United States. Since the 1960s, scholarship programs from oil and gas revenues have provided opportunities for higher education, with educational assistance offices created in the 1980s to help students navigate their academic careers.



Navajo – Window Rock, Arizona: the Navajo Nation extends into northeastern Arizona, southeastern Utah, and northwestern New Mexico, and covers 27,425 square miles. In 1923, a tribal government was established and has since evolved into the largest American Indian government. Today, the Navajo Nation strives to sustain a viable economy for an ever increasing population that now surpasses 250,000. The Navajo Nation operates Diné College, a two-year community college in Tsaile, Arizona, with seven satellite campuses. Currently, Diné enrolls 1,830 students, of which 210 are degree-seeking transfer students to four-year institutions.



Southern Ute – Ignacio, Colorado: the Southern Ute Tribe is located in Southwest Colorado near the northern New Mexico border, with a land area of 1,059 square miles. The Southern Ute Indian Tribe is the largest employer in the Four Corners region with operations and assets in more than fourteen states and the Gulf of Mexico. As a result, the Southern Ute's Financial Plan, enacted in 1999, has been responsible for the overhaul of the Southern Ute Department of Education Scholarship Program, which has provided additional assistance to students pursuing higher education, and in turn, positively impacts drop-out rates.



ADAMS STATE UNIVERSITY

Adams State University (ASU) – Alamosa, Colorado: ASU is a Hispanic Serving Institution (HSI) with 33% Hispanic enrollment, a 52% Hispanic graduate rate, and a total of 47% ethnic minority students. ASU has been recognized for the academic achievement of Hispanic and other minority students, who have a graduation rate that is 90% the rate of majority students. A study by the American Association of State Colleges and Universities (AASCU) found ASU had the third highest Hispanic graduation rate of all 435 AASCU member institutions. ASU is also a member of the Colorado Coalition for the Educational Advancement of Latinos (CO-CEAL), an association of educators devoted to state and national-level, post-secondary education of Latino/Hispanic populations. ASU has been a partner institution since 1995.



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Vance Barksdale and **Stephanie Savage** attended “Chemistry of Energy and Food” at the 2013 American Chemical Society conference in New Orleans where over 15,000 chemists, academics, students, and other professionals met to address one of the most important issues of our time – the relationship between chemistry and food in our society. A wide array of sessions were available including continuing education activities, specialized student programs, governance activities and employment counseling.



In April 2013, **Patrick Ortiz**, an ASU earth science student attended the Association of American Geographers annual meeting in Los Angeles where 7,000 geographers from around the world networked and attended presentations, poster sessions, workshops, and field trips regarding the latest research in geography, sustainability, and GIScience with leading scholars, experts, and researchers in the field.

NEW SACNAS CHAPTER AT ADAMS STATE UNIVERSITY

Fall 2013 marked the beginning of a new SACNAS chapter at Adams State University with start-up funds provided by CO-AMP. Five officers were installed and a constitution was drawn and approved. Chapter members attended the 2013 SACNAS National Conference in San Antonio, TX, the 2014 National Conference in Los Angeles, CA, and the 2015 National Conference in Washington, D.C.



AIMS COMMUNITY COLLEGE

Aims Community College - Greeley, CO: Aims, a Hispanic Serving Institution (HSI) with 32% Hispanic enrollment (41% ethnic minority) with four campuses (Greeley, Loveland, Windsor and Fort Lupton), offers more than 160 degree and certificate programs. Student Support Services at Aims provides college transfer preparation, intensive academic advising, career and major discipline exploration, mentoring, tutoring, and a comprehensive orientation session for URM students. Aims also offers 100 online and in-person workshops each year, called iFocus, has developed a Center for the First Year Experience, and has launched a program called Catalyst to help students be successful in college. Aims has been a partner institution since 1995.



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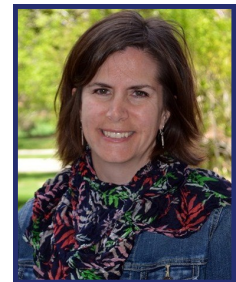
Aims has developed a variety of initiatives, covering a broad spectrum of student needs, to engage and support students at various stages of their education. Partnering with CO-AMP, an “umbrella” program called Emerging Scholars, which includes the Early Alert System, academic and retention advising, academic success planning, and tutoring and student success skills workshops, have shown great success. Another program developed to encourage student engagement and retention is ACES (Academic and Co-Curricular Engagement Series). ACES rewards students for engaging in campus life, succeeding academically and continuing until a degree or certificate is earned. Aims also created its AAA program to develop personalized approaches to learning and success for students so they have a smoother transition into a four-year college. AAA students have a completion rate (they earn a degree or certificate or transfer to a four-year institution) 7% higher than other Aims students not in the program, and 29% higher than the 18% average for community college students nationwide. First-Year Experience/Catalyst Program helps students foster a “mindset” of completion through semester-long content areas organized around themes of connectedness, equity & social inclusiveness, and leadership. The AAA to Catalyst initiative was selected as a best practice through the *Colorado Completes* campaign for achievement related to student retention, engagement, success, and completion.



COLORADO SCHOOL OF MINES



Colorado School of Mines (CSM) – Golden, Colorado: CSM is a high research university with admissions standards among the highest of any public university in the U.S. Research activities at CSM extend from traditional areas such as fossil energy and geophysical exploration to new frontiers in renewable energy and micro fluidic devices. CSM is home to the \$9 million National Science Foundation funded Renewable Energy Materials Research Science and Engineering Center, and collaborates with the National Renewable Energy Laboratory (NREL) in Golden, CO. CSM has been a partner institution since 2002.



**Andrea Salazar Morgan, Director
Minority Engineering Program**
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MINES STUDENTS PRESENT POSTERS AT 2014 SACNAS CONFERENCE

Undergraduate students **Nohemi Almaraz** (right), a junior in Civil Engineering, and **Christopher Matthews** (center), a junior in Petroleum Engineering attended the 2014 SACNAS Conference in Los Angeles, CA with PhD student **Kennda Lynch** (left). Almaraz and Matthews were supported by CO-AMP and have been doing undergraduate research with Lynch for the past year.

Almaraz's poster was titled, "*Structural and Elemental Characterization by Scanning Electron Microscopy of Hypersaline Microbial Mats from the Great Salt Lake Desert*" and focused on analyzing the structural and elemental composition of the hypersaline playa in Pilot Valley to determine the dynamics in this environment which is useful in astrobiology and future space exploration.

Matthew's poster focused on the amount of carbon inside samples taken within Pilot Valley with a research goal to obtain and assess the amount of inorganic and organic carbon in hypersaline sediments in comparison to microbial diversity.



NEW THEMED LEARNING COMMUNITY

As a direct result of a CO-AMP two-day conference (2014) and conveyance of results from CSU's Intervention Study, Colorado School of Mines offered a Themed Learning Community called Nucleus in fall 2015. Nucleus consists of intentionally designed living experiences centered on a variety of educational, cultural, organizational and personal interests which allows students with common interests and pursuits to live together and support each other through planned activities and informal interactions.



COLORADO STATE UNIVERSITY — FORT COLLINS

Colorado State University (CSU) – Fort Collins, Colorado: CSU (lead institution) is a land-grant, Carnegie Doctoral/Research University-Extensive institution, and one of the nation's leading research universities with research in infectious disease, atmospheric science, clean energy technologies, environmental science, and biomedical technology. As an institution, CSU educates more state residents in STEM than any other campus in Colorado, and focuses on URM and transfer student enrollment (which increased by 7% and 16%, respectively, from 2014). CSU has been the lead institution since 1995.



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UDALL FOUNDATION HONORS CSU CO-AMP STUDENTS

Two CO-AMP students received honors from the Udall Foundation in 2015. **Marina Rodriguez** (right), fish, wildlife and conservation biology major was selected as a 2015 Udall Scholarship winner in the category of Environment, and **Arielle Quintana** (left), rangeland ecology major, received an honorable mention in the category of Tribal Public Policy. Quintana is the first CSU student to be recognized in the Tribal Public Policy category.

Marina Rodriguez is a cofounder of the CSU chapter of Strategies for Ecology Education, Diversity, and Sustainability and an active member of the CSU Chapter of Minorities in Agriculture, Natural Resources and Related Sciences (MANRRS). Her undergraduate research, which recently won first place in the undergraduate research competition at the MANRRS national conference, focuses on the nutrient availability of nesting birds at high elevations. Rodriguez plans to continue her research as a graduate student and eventually become a professor to pursue her passion for research, education and avian conservation.



Quintana is a proud tribal member of the Cochiti Pueblo, a small American Indian reservation in New Mexico. Her goal is to attain an education that will help her restore damaged lands, specifically those damaged by forest fires, within her reservation's jurisdictional and ancestral domain. She is focusing her studies particularly in rangeland restoration and conservation biology to meet that goal for her tribe and surrounding pueblo communities, and reestablish healthy, sustainable habitats and ecosystems in the Southwest.

COLORADO STATE UNIVERSITY — PUEBLO

Colorado State University – Pueblo (CSU-P) – Pueblo, Colorado: CSU-P has an enrollment of nearly 50% URMs, including one-third of Hispanic decent, and is a Hispanic Serving Institution (HSI). CSU-P boasts equal retention rates for white and Hispanic students and was named the top HSI in 2008 by the Hispanic Association of Colleges and Universities. CSU-P is a compressive university, offering 26 baccalaureate and six master degree programs. CSU-P has been a partner institution since 1995.



Tina Moore, Director
PROPEL Center
tina.moore@csupueblo.edu

PROPEL CENTER AT CSU-PUEBLO

In an effort to increase Hispanic retention rates in STEM programs, Colorado State University—Pueblo, a Hispanic Serving Institution, developed PROPEL (Providing Opportunities to Excel) in 2013, a program that matches mentors from the community to aid students in STEM disciplines.

“We’re looking for people in STEM disciplines. They could be an engineer or someone with a chemical background; anyone who has a career that a student in STEM might be interested in,” **Tina Moore**, CO-AMP site coordinator and PROPEL director said. Mentors also need to be local, successful professionals who can talk about technical things going on in their area of interest, job development and what it takes for students to get to their type of position,” Moore said. Each mentor is expected to spend eight hours mentoring per semester; four hours of face-to-face and four hours of electronic communications. Added benefits include, allowing students to find local research projects that tie to their mentors’ areas of expertise and connecting local business people as mentors to future interns and workforce members.

“Research has shown that students who have mentors tend to stick with their career. What we want the mentors to do is say, ‘this is where I am, and this is how I got there,’” Moore said. “We want mentors to encourage our students and show them that if the mentor got through it, then the student can get through it too.”



COMMUNITY COLLEGE OF DENVER

Community College of Denver (CCD) – Denver, Colorado: CCD is the only Hispanic Serving Institution (HSI) in the Denver-metro area, and the leading point of entry to higher education for the City and County of Denver. The student population is roughly 50% URM and 25% Hispanic. CCD counts more than 200 business/education partnerships for engaging students in internships and career opportunities. With over 13,000 students, CCD offers more than 125 programs that prepare students for a career, job advancement, or transfer to a 4-year school. CCD is a Member of the Hispanic Association of Colleges and Universities and has been a CO-AMP partner institution since 1995.



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PI DAY 2014 AT CCD

Community College of Denver celebrated Pi Day on March 14, 2014 (Pi Day = 3.14, March 14) with the collaboration of CO-AMP, the Math and Science Department, Office of Student Life and the STEM Discovery Student Organization. Students participated in multiple activities to experience mathematics and learn how math can be used beyond the classroom. The STEM Discovery Student Organization sponsored several exhibits. Exhibits at Pi Day highlighted hands-on science experiments with other exhibits having a career focus. In 2014, CO-AMP students at CCD participated in a marble project developed in their calculus-based physics class.



Photos provided by Zina Stilman / Community College of Denver

FORT LEWIS COLLEGE

Fort Lewis College (FLC) – Durango, Colorado: FLC is a liberal arts college and one of only three Native American-Serving Non-Tribal Colleges in the U.S. that accept American Indian students (tuition free) regardless of state residency. FLC awards more undergraduate degrees and STEM degrees to Native American students than any other college, and graduates approximately 16.4% of all Native American students nationally. Native American enrollment at FLC is 20%, representing 122 American Indian tribes and Native Alaskan villages from 30 states. FLC has been a partner institution since 1995.



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CO-AMP supported **Delilah Dougi**, a senior geology student at Fort Lewis College, during her summer field school experience. Jessica Pierce, CO-AMP site coordinator, said of Delilah, "Her determination and hard work is truly inspiring."

The photo is at the Cripple Creek & Victor Gold Mining Company in Victor, Colorado. "I truly appreciate CO-AMP for their support and encouragement during my summer 2013 Geology Field Methods II Session. Thank you," said Dougi.



Prior to graduation in 2013 from Fort Lewis College with majors in Chemistry and Biology, **Patrick Succo** (2nd from right), a member of the Navajo Nation, participated in a REU at the University of Alaska Anchorage (2012) and the Academic Summer Undergraduate Research Experience at Dartmouth College (2013) where he conducted biochemistry research to "purify and crystallize a mutant HapR protein made from *Vibrio cholera*" (a regulator of virulence gene expression) to understand it at the molecular level and hopefully improve therapeutic strategies to potentially cure bacterial diseases. While a student at Fort Lewis, Succo presented research papers titled,

"Analyzing Potential Inhibitors to End the Journey of Neuron Induced Clostridium botulinum Neurotoxin," and *"A 1H-NMR Study of Water Soluble Metabolites From Bread Yeast as a Model for Learning Bioinformatics and Metabolomics in the General Biochemistry Lab."*

At one point in his academic career, Succo told CO-AMP site coordinator, Jessica Pierce, "I was going to be a mechanic, and then I thought I should try college. Good thing I did because my brother and sister followed me here, and now we are all going to be college graduates." Pictured are his siblings, **Justin Succo** (far left, Senior in Engineering at Fort Lewis) and **Diedra Succo** (far right, 2015 Fort Lewis graduate in Cellular & Molecular Biology).

METROPOLITAN STATE UNIVERSITY OF DENVER



Metropolitan State University of Denver (MSU) – Denver, Colorado: MSU enrolls the highest number of students of color (more than 6,500 in fall 2014, nearly 31% of its student population) than all 4-year colleges in Colorado. *Hispanic Outlook in Higher Education* consistently ranks MSU among the top

100 colleges and universities in the nation for graduating Hispanic students; and *Diverse: Issues in Higher Education* ranks MSU among the top 100 institutions in the nation in awarding baccalaureate degrees to students of color. MSU has been a partner institution since 1995.



Dr. Hsiu-Ping Liu
Associate Professor, Biology
hliu1@mscd.edu

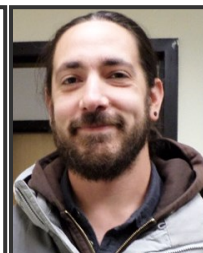


PHOTO: Sarah Beets

If Associate Professor of Biology **Hsiu-Ping Liu** (left) has a mantra, it just might be “Science doesn’t have to be boring. Science doesn’t have to be hard.” Dr. Liu has been letting her students in on this secret since she joined the Metropolitan State University of Denver faculty. She took her message to a whole new level in 2014, as the interim director of the Center for Mathematics, Science and Environmental Education (CMSEE), which was developed to improve educational opportunities for middle and high school students interested in STEM subjects. “Students have a better chance of being interested in and retaining information if they participate in an activity rather than having a teacher talk at them,” said Dr. Liu, who found herself in charge of the CMSEE and its programming following the sudden death of Professor Larry Johnson. Dr. Johnson — a CO-AMP site coordinator since 1996 and dean of the College of Letters, Arts and Sciences — established CMSEE in 1993. One of the main programs is the Summer Science Institute (SSI) which engages local middle school students in fun applications of STEM subjects. Students participate in everything from studying the physics of roller coasters to analyzing the microbiology of water samples. “By showing kids real-world applications for STEM-related fields, we show them how many possibilities they have for the future.”

In addition to her work with SSI, Dr. Liu coordinated the Advanced Placement Summer Institute (APSI), which MSU Denver co-hosted with the Colorado Legacy Foundation. APSI gathered teachers from across the country to help them develop deeper content knowledge within their AP subjects and identify strategies for supporting diverse student populations.

Francisco Sanchez, a Magna Cum Laude graduate in Mechanical Engineering Technology, was awarded the first Larry Johnson STEM Opportunity Scholarship in fall 2014, and was recognized as outstanding graduate in Engineering and Aerospace and Advanced Manufacturing. His undergraduate research project on an “Adaptable Wind Turbine System” was invited to compete at the 4X4 Design Competition in Beijing, China in June 2015. Sanchez currently works for a marine engineering company in Denver.



NORTHEASTERN JUNIOR COLLEGE

Northeastern Junior College (NJC) – Sterling, Colorado: NJC is Colorado's largest residential, 2-year college. NJC's graduation rate is twice the national average and is one of the highest in Colorado among both 2-year and 4-year colleges. NJC has an outstanding transfer record with approximately 55% of full-time students planning to go on to a 4-year institution. NJC is unique in that it is the first college in Colorado to become an iPad college, an initiation requiring students to have an iPad in order to immerse them in technology and prepare them for future careers. NJC joined CO-AMP in April 2010.



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STEM FIELD EXPERIENCE

In May 2014, CO-AMP sponsored five Northeastern Junior College students (**Alexis Blagg**, below left; **Denzel Stewart**; **Dominick Pollack**; **Mathew Helfer**; and **Xavier Cox**, below right) to travel to three natural areas (Colorado National Monument, Arches National Park, Canyonlands National Park) for a STEM field experience. Students combined geography, science, engineering, technology, and math in real life settings. Among the lessons learned were identifying rock formations in the canyons and identification of plant and animal species. Arches National Park, containing the world's largest concentration of natural stone arches, is a red, arid desert, punctuated with oddly eroded sandstone forms such as fins, pinnacles, spires and balanced rocks.



Photos provided by Cyndi Hofmeister / Northeastern Junior College





OTERO JUNIOR COLLEGE

Otero Junior College (OJC) – La Junta, Colorado: OJC is a Hispanic Serving Institution (HSI) with students enrolled in 25 degree programs. Over 97% of OJC students are employed upon graduation or transfer to 4-year colleges or universities. OJC has been awarded two grants totaling \$10.3 million through the U.S. Department of Education to increase student academic success; retention, transfer, and graduation rates; improve professional development activities for faculty and staff; and to improve access to technology support. These have allowed OJC to develop several new STEM programs (including biotechnology and agricultural science) as well as offer STEM outreach programs and camps. OJC joined CO-AMP in 2011.



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STEM MENTORS AT OJC

At right, CO-AMP students from Otero Junior College (left to right, **Jordan Moniz**, **Christian Estrada**, **Gabe Guerrero**) participate in the STEM Mentor Program as supplemental instructors in the OJC Math Lab. Mentors tutor students in pre-college level math courses, trigonometry and calculus, and share first-hand knowledge on successfully preparing for math courses. Math tutors provided 320 hours of tutoring to OJC students.

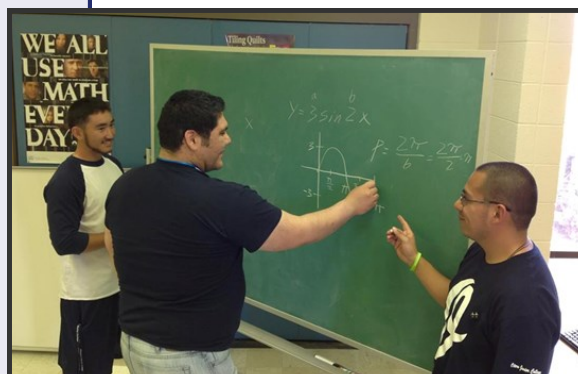


Photo provided by Laurine Szymanski / Otero Junior College

NEW SACNAS CHAPTER FOUNDED AT OTERO JUNIOR COLLEGE

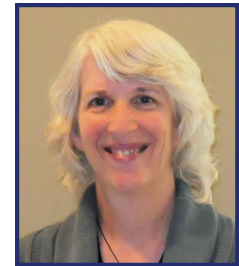
In spring 2014 Otero Junior College established a SACNAS Chapter headed by Yolonda Jaramillo, STEM Grant Activity Directory. The first chapter meeting was held on August 26, 2014, and in October, the first chapter presentation, a Forensics Laboratory by Dr. Kristi Tschetter, Biotech faculty, took place.

TRINIDAD STATE JUNIOR COLLEGE



Trinidad State Junior College (TSJC) – Trinidad, Colorado:

TSJC is a Hispanic Serving Institution (HSI) and was awarded a Title V Student Success Center (HSI) grant to increase graduation and retention rates of Hispanic and other minority students by providing intake testing, technology assistance, intervention counseling, career skills development, and transfer advising. TSJC has established statewide articulation agreements with most Colorado 4-year institutions to ensure minimal interruption to students' academic progress after transferring. TSJC has been a partner institution since 1995.



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TSJC ROBOTICS TEAM

CO-AMP students at Trinidad State Junior College (below, left to right: **Hayden Alworth**, lead programmer; **Andrez Leyva**, lead builder; **Mary Carpenter**, electronics lead; **Eric Perry**, lead designer; and **Camille Arnn**, team captain) worked together on the Autonomous Logical Land-based Electronic Navigator, aka A.L.L.E.N. (a robot entry), for the 2014 Robotics Challenge held at the Great Sand Dunes National Park and Preserve. A.L.L.E.N. has four wheels, a sensor platform, a flexi-force bump sensor, a beacon transceiver, a compass, a tilt sensor and Sharp Infrared sensors, all working together using a highly advanced computer language installed on a computer chip developed by Parallax, Inc., the Rocklin, CA technology firm assisting the TSJC robotics students. In addition, A.L.L.E.N. is completely autonomous, making all its decisions based on its programming, not relying on a remote control. TSJC's robotics team also presented at the Colorado Space Grant Consortium's research symposium at the University of Colorado in April 2014 to judges in the aerospace/robotics industry.



Photos courtesy of Greg Boyce / Trinidad State Junior College



UNIVERSITY OF COLORADO — BOULDER

University of Colorado Boulder (CU-B) – Boulder, Colorado: CU-B is a Carnegie Doctoral/Research University-Extensive institution, and is one of only 34 U.S. public research universities invited to join the Association of American Universities. CU-B is ranked as a Tier 1 research institution with four Nobel laureates and more than 50 members of prestigious academic academies. CU-B offers 85 majors at the bachelor's level, 70 at the master's level, 50 at the doctoral level, and has more than 90 research centers, institutes, and laboratories. CU-B has an 86% retention rate and ranks #1 in graduation rates for Colorado public universities. CU-B has been a partner institution since 1995.



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Director
Student Engagement & Community
Building Programs
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University of Colorado **Boulder**

Ian Her Many Horses will graduate from the University of Colorado Boulder's School of Education with a PhD in Computer Science Education in 2016. His research focuses on how elementary students learn about design and computer science principles through computer game creation. Her Many Horses is a co-author of *"Scalable Game Design: A Strategy to Bring Systemic Computer Science Education to Schools through Game Design and Simulation Creation."* He was profiled in LSAMP's 2011 "Underrepresented Minorities: A Rich Pool of STEM Talent."



As an undergraduate student, Her Many Horses benefited from the support of LS-COAMP through his participation in the Multicultural Engineering Program learning community. He became a student leader supporting underrepresented students in engineering and science through various programs including the Oyate Native American Student Organization and the American Indian Science and Engineering Society (AISES) at CU-Boulder.

Her Many Horses grew up on the Rosebud Indian Reservation in South Dakota and graduated from Todd County High School, where he also taught Geometry, Pre-Calculus, and C++ Programming after earning his Bachelor of Science degree in Computer Science in 2006 and his Math Teaching Certificate in 2007 from the University of Colorado Boulder.

UNIVERSITY OF COLORADO — COLORADO SPRINGS

University of Colorado Colorado Springs (UCCS) – Colorado Springs, Colorado: UCCS has a diverse student body consisting of 23% ethnic minority students with URM graduation rates exceeding the average at peer universities. Management of CO-AMP at UCCS was recently transferred from the Applied Engineering department to the Pre-Collegiate Support and Success Center to better serve a wider range of STEM students. UCCS has been a partner institution since 1995.



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Executive Director,
Pre-Collegiate Support and
Success Center
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University of Colorado
Colorado Springs



University of Colorado at Colorado Springs (UCCS) CO-AMP students toured corporate facilities in the Colorado Springs area (Aerospace Corporation and Northrop Grumman) and also had opportunities to meet recruiters for internships and employment.

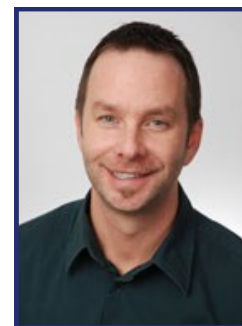


UNIVERSITY OF COLORADO — DENVER



University of Colorado
Denver

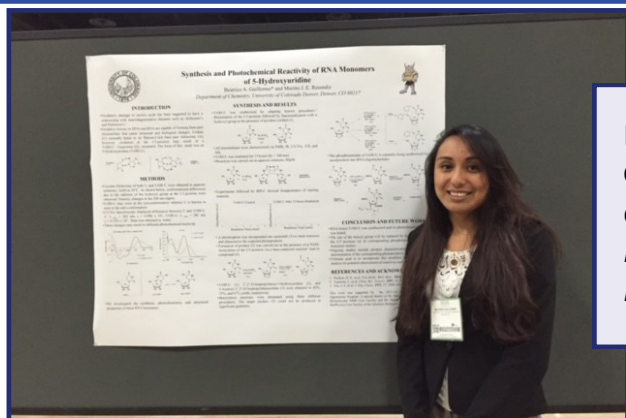
University of Colorado Denver (CU-D) – Denver, Colorado: With two campuses in the Denver metro area, CU-D offers more than 115 programs in 13 schools and colleges at the undergraduate, graduate, and doctoral levels to over 15,000 students (38% URM). Retention rates for URM students compare to that of all students (83% and 84% respectively). Many opportunities exist for students with internships and employment through Denver-area companies, particularly in the telecommunications and computing industries. CU-D has been a partner institution since 1995.



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ImPACT PROJECT

CO-AMP staff members have developed a partnership with the University of Colorado System (UC Boulder, UC Colorado Springs, UC Denver, and all CO-AMP partners) to create an inventory called ImPACT. ImPACT is an exhaustive directory of URM STEM pipeline programs, including those focused on outreach, that are active across the University of Colorado system (all CO-AMP 4-year institutions will eventually become part of the inventory). This directory is a necessary first step in achieving the vision of becoming an integrated network that provides seamless, continuity of support within the CO-AMP Alliance. Information collected through this effort will be used by those who maintain associated websites/webpages to update information about outreach and pipeline programs, thereby helping to ensure the community has access to accurate information about available opportunities; and establish a robust, longitudinal tracking system utilizing existing information systems, supported by IT professionals at participating institutions.



In 2014, CO-AMP undergraduate student **Beatrice Guillermo** presented her research at the ABRCMS conference in San Antonio, TX, titled *"Synthesis and Photochemical Reactivity of RNA Monomers of 5-Hydroxyuridine."*

NEW PARTNER: UNIVERSITY OF DENVER

University of Denver (DU) – Denver, Colorado: The Carnegie Foundation classifies DU as a research university with high research activity. DU enrolls approximately 5,000 undergraduate students and 6,000 graduate students with the average admitted applicant being in the top 25% of his/her graduating class. In addition, DU is No. 1 in the nation among the percentage of undergraduate students who participate in study abroad programs and was named #15 among the most collaborative small colleges in the United States by the Huffington Post. DU joined CO-AMP in 2015.



Anthea Johnson Roen
 Director for Inclusive Excellence
 College Access & Pipeline Programs,
 Center for Multicultural Excellence
 anthea.johnson@du.edu



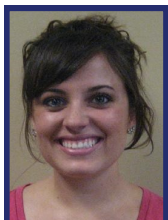
In July 2015, the University of Denver (DU) joined CO-AMP as a partner institution. The CO-AMP program resides under the Interdisciplinary Research Incubator for the Study of (In)Equality or IRISE. STEM undergraduate students will participate under IRISE's Pioneer Pathways Program (P3). Through P3, CO-AMP students will be provided effective retention and transfer bridging programs, as well as early faculty advising, tutoring, and mentoring. P3 will also monitor academic progress to promote persistence to graduation. P3 has a specific goal to nurture the strengths of CO-AMP students and prepare them to pursue additional academic degrees, such as a Masters or Doctorate. In connection to DU's commitment to Inclusive Excellence and Diversity, P3 provides students with impactful research opportunities, social and cultural support, meaningful mentorship, and personal growth. With CO-AMP support, P3 is set to improve, expand or build math skills and science course assistance programs by linking tutoring and student mentoring to current graduate student volunteers and faculty. In addition, through IRISE, CO-AMP students will have access to expert advice about applying and preparing for graduate school, as well as being paired with current graduate student mentors.



BRIDGE TO THE DOCTORATE COHORT 4: COLORADO SCHOOL OF MINES (2010-2012)



Daniel Cano
Engineering Systems
B.S. Electrical Engineering 2010
Colorado School of Mines



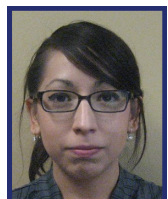
Andrea Casias
Metallurgical & Materials Engineering
B.S. Metallurgical & Materials
Engineering 2010
Colorado School of Mines



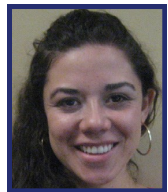
Brendan Geels
Engineering Systems
B.S. Mechanical Engineering 2010
New Mexico Tech



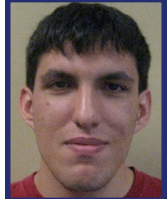
Kerri Hickenbottom
Environmental Science & Engineering
B.S. Civil Engineering 2010
University of Nevada — Reno



Stephanie LaCrue
Civil Engineering
B.S. Civil Engineering 2010
Colorado School of Mines



Susana Macias
Environmental Science & Engineering
B.S. Environmental Engineering 2010
University of Colorado — Boulder



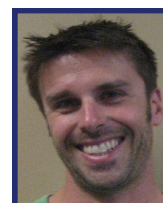
Manuel Montano
Chemistry
B.S. Chemistry 2010
Colorado School of Mines



Ashley Nagle
Civil Engineering
B.S. Civil Engineering 2010
Colorado School of Mines



Margarite Parker
Mechanical Engineering
B.S. Chemical Engineering 2010
University of Colorado — Boulder



Shay Robinson
Mechanical Engineering
B.S. Engineering Physics 2010
Colorado School of Mines



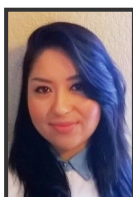
David Walter
Nuclear Engineering
B.S. Engineering Physics 2010
Colorado School of Mines

Colorado School of Mines was awarded the Bridge to the Doctorate (BD) grant for 2010-2012 from the National Science Foundation to recruit and support underrepresented minority students interested in pursuing doctoral degrees in STEM graduate research programs. Research and education at Mines are founded on the conviction that future infrastructure and societal developments are dependent upon the availability of energy, the sustainable development of the Earth's resources, and the environmental consequences of these processes and their interactions. This foundation at Mines embraces a responsibility to attract, shape and provide engineering and scientific talent, like these BD Fellows, to help address the world's technological and societal challenges.

BRIDGE TO THE DOCTORATE COHORT 5: UNIVERSITY OF COLORADO DENVER (2013-2015)



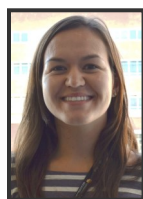
Andres Andrade
Biology
UC Denver
Current PhD program:
Forest Ecology



Cindy Munoz
Mechanical Engineering
UC Denver
Current PhD program:
Mechanical Engineering



David Ramirez
Mechanical Engineering
University of Colorado Boulder
Current PhD program:
Mechanical Engineering



Ashley Bourke
Biochemistry & Molecular Biology
Michigan State University
Current PhD program:
Pharmacology



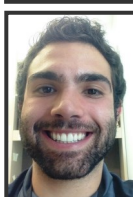
Chinyere Okpara
Mathematics
Rutgers University Newark
Current PhD program:
Applied Mathematics



Madia Stein
Chemical Engineering
University of New Mexico
Current PhD program:
Bioengineering



Henok Ghebrechristos
Physics
University of Colorado Boulder
Current PhD program:
Computer Science



David Presby
Exercise Science
Rutgers
Current PhD program:
Integrated Physiology



University of Colorado
Denver



Natalia Gurule
Biochemistry
University of New Mexico
Current PhD program:
Cancer Biology



Alejandro Henao
Civil Engineering
University of Colorado Boulder
Current PhD program:
Civil Engineering



Natalie Herrera
Immunology and Microbiology
University of California Irvine
Current PhD program
Microbiology



Braxton Jamison
Biology
University of Texas
at San Antonio
Current PhD program:
Immunology

University of Colorado Denver was awarded Bridge to the Doctorate funding through the National Science Foundation and enrolled their cohort of twelve Fellows in fall 2014. CO-AMP has now been funded for five BD cohorts—the first three awards beginning in 2006 to Colorado State University, and the most recently completed cohort at the Colorado School of Mines. With its two campuses, one in downtown Denver and one at the Anschutz Medical Campus (AMC), UCD is the only urban, research-intensive institution in the Rocky Mountain States, and uniquely poised to offer state-of-the-art pre-doctoral training in a broad range of STEM disciplines to the BD cohort.

Currently, UCD offers sixteen masters and twenty-nine doctoral degree programs in STEM disciplines. The proportion of undergraduate students of color at the combined Denver Campus and AMC has increased each year since 2005 and achieved a high of 32% in 2011. During this same time, the percent of students of color at the AMC has increased from 21% to 25%. With fifty official programs and events that support and promote diversity, a strong urban focus, and on-going efforts and commitments to pipeline programs on both campuses, UCD brings a distinctly unique BD program to CO-AMP.

INTERNATIONAL CONNECTIONS



In July 2014, Adams State University CO-AMP student **Darin Sisneros** travelled to Australia to participate in a two-week academic program. The course focused largely on the immense biodiversity of organisms and diverse habitats of the rain forest. In addition to guided group experiences, Sisneros was able to learn from aboriginals about their culture, history, customs, and how they were affected after European influence.



Sisneros summed up his international experience by saying, "This program was truly an experience of a lifetime and it allowed me to be more culturally competent." During his time in Australia he was also able to explore Sydney, national parks, and the Great Barrier Reef.



Photo provided by Renee Beeton / Adams State University



In May 2014, Fort Lewis College CO-AMP students **Noah Garcia** (engineering), **Tori Bishop** (engineering), **Ashley Garcia** (biology), and **Emily Aguierre** (engineering) participated as part of a ten-person team that spent two weeks in the remote village of San Francisco de Limon in northern Nicaragua constructing a water system. The four CO-AMP students worked on the Engineers Without Borders project throughout the school year completing the engineering design, preparing an education program and necessary logistics.



Bishop was part of a senior design team at FLC that developed a new intake structure design for small gravity-fed water systems in the developing world. This is an important, year-long, capstone design course that all seniors take. For Bishop it was even more significant because after completing the design in April, she traveled to Nicaragua and lead a group of students and villagers who built the structure.

In addition to the intake structure, students constructed a ferro-cement water storage tank and a 4km pipeline that ran from the intake structure to the tank. Students lived with families and worked side-by-side with villagers during the duration of the project.



Emily Aguierre works on the tank (above).
Tori Bishop and Ashley Garcia hike to the water source (below).



Above, Noah Garcia and a villager mix concrete for the tank, and below, Ashley Garcia cuts bamboo.



Photos provided by Don May / Fort Lewis College

INTERNATIONAL CONNECTIONS (continued)

Adams State University biology student **Keiko Woodyard** traveled to Costa Rica in the summer of 2012 as part of a program through New York University. This international experience provided Woodyard the opportunity to explore the endangered ecosystem of plants and animals in the high altitude cloud forests at Poas Volcano National Park and at the Monteverde Biological Private Reserve. She also studied rain forest ecology at low altitudes at Tortuguero National Park where she was able to observe nesting behavior of green turtles. In addition, she combined both local culture and ecology with a visit to a small coffee plantation (pictured) near the town of Grecia. At the plantation, students discussed the process of growing coffee and the implications of agriculture in a region that has tremendous biodiversity in a relatively small geographical area. According to Woodyard, "This was an amazing trip. I have never seen so many insects, reptiles, and birds with so many different species of plants in my entire life. I am so grateful to everyone that made this trip possible, including CO-AMP."



Noah Garcia (pictured far right in the photo) works with Quechua villagers to construct latrines in the remote village of Lilla, Ecuador in the all-volunteer program, Engineers Without Borders (EWB) at Fort Lewis College. In addition to leading construction, Garcia was one of two much valued interpreters for the Village Aid Project. EWB supports students traveling to third-world countries by using engineering skills to improve the community infrastructure such as clean water, power, sanitation, and education.



Students, faculty, and community members work together during the school year prior to the trip to plan their projects, and then raise all of the funds necessary to carry out the construction, including the price of materials. In summer 2013, CO-AMP supported four EWB students to travel to Ecuador and Nicaragua.

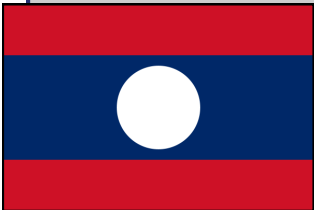


INTERNATIONAL CONNECTIONS (continued)

Andrea Dailey, a student in the engineering program at Fort Lewis College, Durango, participated in the Engineers Without Borders (EWB) program in Ecuador in 2011. As part of this experience, Dailey worked on the design of water supply projects and traveled to help construct the systems for the communities of Guadalupe and Gallo Rumi located in the Andean highlands of central Ecuador. Dailey was surprised to find many similarities between the indigenous culture of Ecuador and her own Navajo culture. This was her first trip outside the Four Corners region of the Southwest, and it had a dramatic impact on her world view and the positive impact she, as an engineer, can have when volunteering to help others.



Fort Lewis CO-AMP engineering student, **Autumn Miller**, worked on Engineers Without Borders (EWB) water supply projects in Laos and Ecuador. In the Hmong village of Ban Pakhom, Miller helped teach school-aged children about the importance of hand washing to improve health. She has conducted several engineering as-built surveys, performed water quality testing and constructed concrete tanks. The hands-on EWB engineering experiences have played an important part in her decision to become an engineer.



Fort Lewis CO-AMP engineering student, **Autumn Miller**, worked on Engineers Without Borders (EWB) water supply projects in Laos and Ecuador. In the Hmong village of Ban Pakhom, Miller helped teach school-aged children about the importance of hand washing to improve health. She has conducted several engineering as-built surveys, performed water quality testing and constructed concrete tanks. The hands-on EWB engineering experiences have played an important part in her decision to become an engineer.

The hands-on EWB engineering experiences have played an important part in her decision to become an engineer.



In 2012, **Nathaniel Samora**, Adams State University student participated in a 2-week study in Tanzania and Kenya that explored the rich natural history of East Africa. This international experience was supported by New York University (NYU) and was taught by Dr. Timothy Armstrong who teaches biology, ecology, anatomy, environmental sciences, fisheries and wildlife management as well as several other courses at Adams State University. Samora observed the wildlife found in different habitats including wetlands, forests, and open savannahs. The international experience focused on the ecology of the organisms observed, their interactions, and their impact on their environment. During the trip, Samora had the opportunity to meet some of the traditional cultures still found in East Africa, discuss their relationship with wildlife, and meet with local conservation leaders to learn more about ongoing efforts to conserve the area's unique wildlife.



CO-AMP CONFERENCES

Winter Meeting at University of Colorado — Denver

February 17, 2012

The Winter CO-AMP Steering Committee meeting was hosted by **Dr. Khushnur Dadabhoy** of University of Colorado Denver, on February 17, 2012. CO-AMP members were welcomed by **Dr. Raul Cardenas**, Associate Vice Chancellor for Student Affairs at UC Denver. **Dr. Ernest Chavez**, Co-PI, led a discussion on CO-AMP's role in addressing the critical need for a new generation of scientists and engineers, as well as outlining CO-AMP's goals and objectives for the coming years. **Dr. Cheryl Beseler**, CO-AMP Research Coordinator, presented a "Synopsis of Preliminary Math Study findings: The role of mathematics and how CO-AMP partners are addressing the mathematics challenge." The meeting was concluded with four breakout groups discussing math skills issues from the perspective of 2-year and 4-year institutions.



University of Colorado
Denver | Anschutz Medical Campus



Spring Meeting at Colorado State University

May 18, 2012

The CO-AMP Governing Board Meeting was hosted by Colorado State University - Fort Collins, on May 18, 2012. CO-AMP members were welcomed by **Dr. Rick Miranda**, Provost and Executive Vice President of CSU-Fort Collins and CO-AMP Principal Investigator. **Dr. Ernest Chavez**, Co-PI, led a discussion on national trends in minority education and CO-AMP's focus for broadening participation research. **Dr. Gloria Crisp** (left) from the University of Texas at San Antonio was the featured guest speaker. Dr. Crisp's presentation was titled: "Factors influencing the success of undergraduate STEM and non-STEM majors attending Hispanic Serving Institutions: Implications for policy and practice." Connie Novicoff from Metropolitan State University of Denver was a special guest and presented, "The Math Peer Study Program at Metropolitan State."




Colorado
State
University



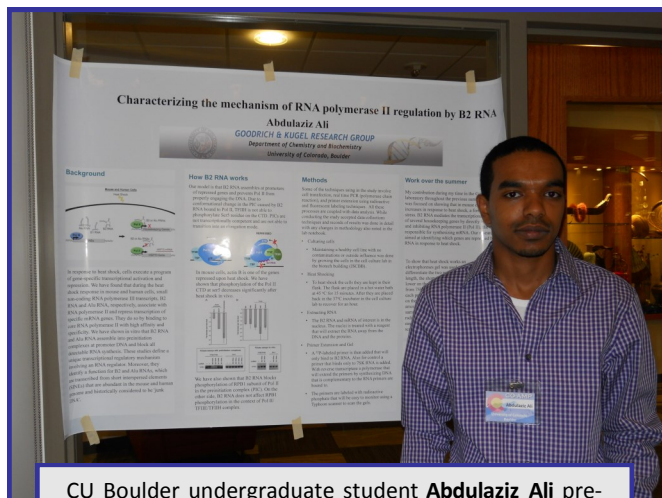
CO-AMP CONFERENCES (continued)

Fall Meeting at University of Colorado — Boulder

November 2, 2012

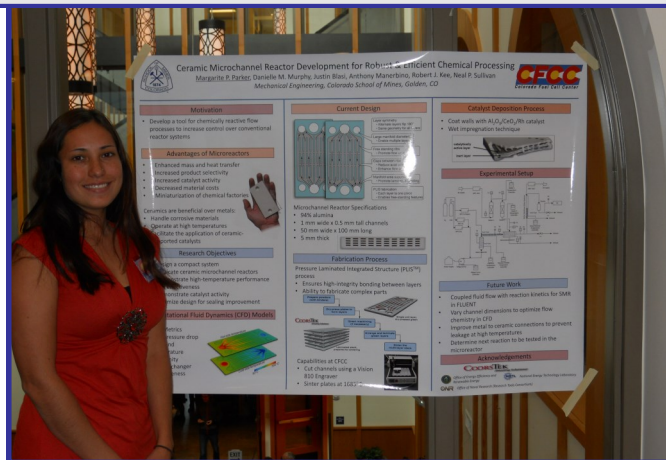
The Winter CO-AMP Steering Committee meeting was hosted by **Dave Aragon** and **Dr. LaRuth McAfee** of University of Colorado Boulder, on November 2, 2012. CO-AMP members were welcomed by **Dr. Russ Moore**, CU Boulder Provost. **Dr. Ernest Chavez**, CO-AMP Co-PI, led a discussion on data from the Colorado Commission of Higher Education, as well as a discussion of CO-AMP data and goals for the coming years. Guest speakers from University of Colorado Boulder included, **Dr. Anne Dougherty** and **Silva Chang** from CU's Department of Applied Mathematics, who presented "Mathematics Solutions for First-year Engineering Students." **Dr. John Rand** (left), National Science

Foundation program officer, was the keynote speaker. His presentation included "Building a Successful Community College STEM Initiative" and a B2B funding update from NSF. Students from the Colorado School of Mines Bridge to the Doctorate program and CU Boulder undergraduate students answered questions about their research during a research poster session.



CU Boulder undergraduate student **Abdulaziz Ali** presented his research, "Characterizing the mechanism of FNA polymerase II regulation by B2 RNA."

Margarite P. Parker, BD4 Fellow at Colorado School of Mines, presented her research, "Ceramic Microchannel Reactor Development for Robust & Efficient Chemical Processing."



CO-AMP CONFERENCES (continued)

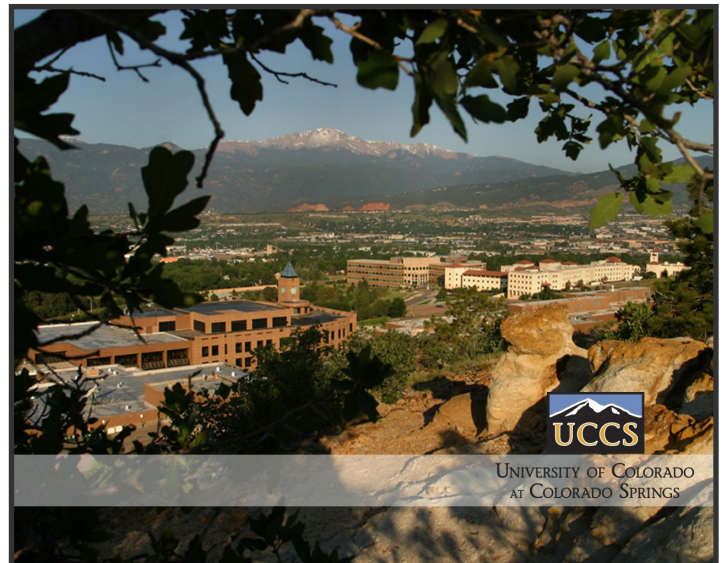
Fall Meeting at University of Colorado — Colorado Springs

October 4, 2013

At the CO-AMP Fall Meeting held at University of Colorado Colorado Springs, guest speaker **Dr. Ed Galindo** (pictured below) presented “Science is science, and math is math. What does culture have to do with it?” Dr. Galindo is a faculty member at University of Idaho and Idaho State, affiliated with Boise State and Utah State, and consults with NASA and NSF. He is also at the forefront of a collective effort to introduce an innovative Indigenous Science, Technology, Engineering and Math (ISTEM) graduate studies program, aimed at providing accessible, relevant graduate level education to Native Americans. Dr. Galindo has done a great deal of innovative work related to incorporating native culture into science. For example, Dr. Galindo used experiences from the ISTEM Outdoor Classroom in Idaho to illustrate the importance of the outdoor classroom to Native students. “Students are hanging on every word – the way their ancestors learned— by oral example, right in the field.”

Dr. Galindo also described his work with the Natural Resources Tribal Cooperative (NRTC) which coordinates research and educational efforts for Native Americans through the Native Waters Project supported by the National Science Foundation (NSF) and the Rocky Mountain Space Grant Consortium (RMGC), a NASA funded program. “The need to develop environmental pathways to the study of science and all academic subjects for Native American students is critical,” Galindo said.

UCCS University of Colorado
Colorado Springs



CO-AMP CONFERENCES (continued)

CO-AMP Spring Conference at Colorado State University

May 29-30, 2014



A two-day spring conference was held on the Colorado State University campus entitled, *Broadening Participation through Campus Innovation: Methods and implementation strategies for STEM*. The conference introduced empirically supported tools and methods to enhance, retain, and graduate underrepresented populations in STEM; and to provide attendees with hands-on workshops related to the implementation of these methods at their institutions. The first day of the conference focused on peer mentored learning/Peer-Led Team Learning (PLTL) and Learning Assistant (LA) Programs. Focus for the second day was on Learning Communities for Community Colleges and Universities (including both residential and commuter campuses).

Scholars from across the country discussed their successful programs, including testimonials from CO-AMP students who benefited from these programs. Scholars included: **Dr. Laurie Langdon** from the University of Colorado Boulder who presented: *The Learning Assistant (LA) Model for Peer-Mentored Learning*; **Dr. Lance Shipman Young** from Morehouse College in Atlanta, Georgia; **Tae Nosaka** from Colorado State University Fort Collins who presented: *Against All Odds – The Impact of a Comprehensive Residential Learning Community on a Diverse Student Population*; **Liya Escalera** and **Amparo Hernandez-Folch** from Bunker Hill Community College in Boston Massachusetts; and **Ann Scarritt** and **Robyn Sandekian** of the University of Colorado Boulder who presented: *A Taste of CU Boulder Learning Communities - Residential Academic Programs in Engineering and Leadership, and Engineering/Math Centers*.



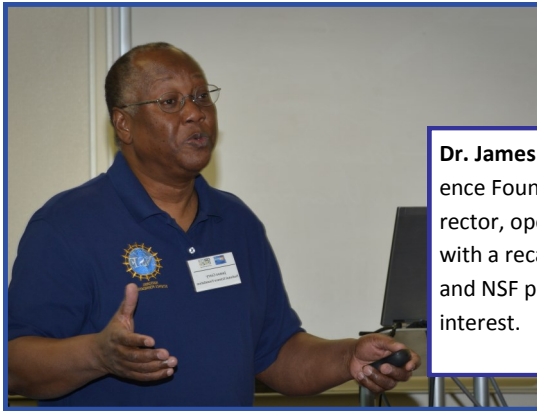
Dr. Rick Miranda (above right), Provost/Executive Vice President and CO-AMP Principal Investigator, welcomed attendees to the Spring Conference. Photo at left shows **Dr. James Curry** presenting the NSF poster, "Young STEM Scholars Point to LSAMP's Many Faces" to **Dr. Ernest Chavez**, CO-AMP Director. Break-out workshops (below) were conducted by presenters each day at the conference.



CO-AMP CONFERENCES (continued)

CO-AMP Spring Conference at Colorado State University (continued)

May 29-30, 2014



Dr. James Curry, National Science Foundation Program Director, opened the Conference with a recap of the NSF vision and NSF programs of special interest.



Liya Escalera (left) and **Amparo Hernandez-Folch** (right) from Bunker Hill Community College in Boston, Massachusetts presented on *Learning Communities at a Commuter College*.



Dr. Lance Shipman Young from Morehouse College in Atlanta, Georgia presented: *A Path to STEM Success: Peer-Led Team Learning in the Division of Science and Mathematics*.



Carissa Marsh (top left), graduate student from University of Colorado Boulder and former Learning Assistant, discussed her experiences with LA-model courses. Colorado State University students, **Joseph Espinoza** (top right), **Bayleigh Arey** (bottom left), **Willy Salinas** (bottom center), and **Alexis Palmer** (bottom right) provided testimonials on the benefits of Learning Communities.

CO-AMP CONFERENCES (continued)

CO-AMP Spring Meeting at the National Renewable Energy Laboratory

April 24, 2015

The National Renewable Energy Laboratory in Golden, CO, hosted the CO-AMP 2015 Spring Meeting, by bringing together site coordinators from fifteen partner sites, along with CO-AMP students, to discuss opportunities for minority students pursuing careers in STEM. Special guest, **Dr. Tasha Inniss** (top right), National Science Foundation Program Director, opened the meeting with updates on funding, current NSF structure, future goals, award types, and other opportunities at NSF. Attendees made connections, learned about different CO-AMP programs, and toured the NREL facility (below, right). The event also included CO-AMP updates from Program Director Dr. Ernie Chavez; an industry panel on internships for students featuring Boeing, Lockheed Martin, and NREL representatives (below, left); a presentation by **Dr. Walter Conwell** (bottom right) on “The



IMPACT Initiative: Building a Seamless Pipeline;” and an introduction on NREL’s research workforce from Deputy Lab Director Dana Christensen. “One of the things we’ve been working on is science identity,” Dr. Beverly Marquart, CO-AMP Program Manager, explained. “Encouraging science identity helps students feel like they are scientists—that they belong in the science community—making them more confident in what they do. And one of the key pieces of a science identity is being involved in internships and professional organizations. We wanted to provide our students with these insights.”





www.coamp.colostate.edu



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