



CO-AMP

CO-AMP Commentary

2010/2011

LOUIS STOKES COLORADO ALLIANCE FOR MINORITY PARTICIPATION

CO-AMP Provides More Than Financial Support to Students!



CO-AMP programming has significantly helped participants make profound and successful changes over the life of the LS AMP program in Colorado! The number of URM students enrolled in STEM programs at CO-AMP partner institutions rose from 1,922 students (in 1996) to this year's figure of 3,529 students (an 84% increase). Likewise, the number of URM students earning a Bachelor's degree grew from 215 to 407 (an 89% increase) during the same time period. This academic year, CO-AMP supported 533 Level I Direct Participant students (a 37% increase over last year!). Since its inception, CO-AMP has established numerous programs and activities at partner institutions that have now institutionalized many of them.

In addition to graduation and enrollment rates, the following CO-AMP student feedback tells us how our programs are really making a difference in their lives, "Without support from CO-AMP, I would not have graduated. My CO-AMP mentor was my lifeline." And another student who benefitted from a CO-AMP stipend said it very poignantly, "The CO-AMP stipend did, of course, help me financially as I was in dire need at the time.... [but] it did mean more than that. I was getting pretty discouraged and a little down on myself. When I was told I'd be receiving the stipend it really helped me believe in myself again; it was as if someone else believed in me as well." These statements from students are a true testament to the dedication of our partners in the CO-AMP Alliance! Keep up the great work!

Welcome New Staff!

Dr. Cheryl L. Beseler — Colorado State University

Dr. Cheryl Beseler recently joined CO-AMP as Research Coordinator. Her role is to increase understanding of what works to increase the success rate of underrepresented groups in higher education; promote student interaction with faculty; and encourage students to continue into graduate school. Dr. Beseler has an educational background in statistics, environmental health and biochemistry; and teaching experience in all three disciplines. In her professorial research experience, Dr. Beseler has personally witnessed the benefit to students and faculty by having students actively engaged in research early in their academic careers.



CO-AMP LEADERSHIP



Dr. Rick Miranda
Principal Investigator



Dr. Ernest Chavez
Co-Principal Investigator

Management Team



Mr. Dave Aragon



Dr. Hector Carrasco



Dr. Larry Johnson
MSC

Staff



Dr. Don May
Data Manager



Dr. Rose Shaw
External Evaluator



Dr. Beverly Marquart
Program Manager



Erin Whipple
Program Support

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BRIDGE TO THE DOCTORATE 2010 - 2012

BD4 at Colorado School of Mines

Colorado School of Mines (CSM) received the Bridge to the Doctorate (BD) award 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. The principals for the BD program at CSM are Dr. Linda Figueroa and Dr. Junko Munakata Marr, both associate professors of environmental science and engineering, and Jahi Simbai, director of graduate recruiting and admissions.

Colorado School of Mines, founded in 1874 and located in Golden, CO, is a public research university devoted to engineering and applied science. CSM has distinguished itself by developing a curriculum and research program geared towards responsible stewardship of the earth and its resources. In addition to strong education and research programs in traditional fields of science and engineering, CSM is one of a very few institutions in the world having broad expertise in resource exploration, extraction, production and utilization.

Research and education at CSM are founded on the conviction that future infrastructural 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. At CSM these inherently related focus areas represent not only extraordinarily fertile ground for institutional advancement, but they also embrace a responsibility to attract, shape and provide engineering and scientific talent to help address the world's technological and societal challenges.

CO-AMP congratulates the new BD Fellows at CSM!



2010 COAMP-BD Fellows and Advisors: (Back row, L to R) Jahi Simbai, Dr. Linda Figueroa, Dr. Marte Gutierrez, Daniel Cano, Brendan Geels, Dr. Junko Munakata-Marr, Shay Robinson, Dr. Eric Dickenson, Dr. Tzahi Cath. (Front row, L to R) Ashley Nagle, Stephanie LaCrue, Manuel Montano, Susana Macias, Kerri Hickenbottom, Andrea Casias, Margarite Parker. Not pictured: David Walter.



CO-AMP Student Assists Design Team

Senior engineering students at Colorado State University redesign incubators to better transport premature babies

There is no thrill quite like bringing a newborn baby home from the hospital. But for some parents, moving an infant can be an anxious experience if the baby has medical conditions or otherwise requires extraordinary care.

A special incubator developed by pediatricians in the 1950s was designed to transport infants less than a month old, called neonates, between hospitals. Incubators have gradually evolved over the years, but neonatologists lobbied for improvements to better protect and support the life processes of these fragile beings.

To answer that call, CO-AMP student, Daphen Pino (photo, far left), and five other women undergraduate engineering students at Colorado State University devoted their senior year to perfecting a neonatal transport system, a design that earned them first place at CSU's Engineering Days.

With the goal of creating a prototype that would dramatically improve the existing Neonatal Transport Incubators (NTIs), the team began by researching existing NTIs and meeting with neonatal specialists at various hospitals. The team focused on the design, construction and testing of a prototype that could be used in both richer and poorer countries, with the goal of producing a product that was not only better for the baby and caregivers, but also less expensive, easier to use, and energy efficient.

Stabilization of infants and vibration during transport of existing NTIs were primary concerns identified by medical staff. Vibration from road surfaces, ventilation machines, and other equipment impairs monitoring during transport and can cause brain damage, bruises, and discomfort to infants. In order to reduce vibration, the students added eight bump stops and two air springs. Redesigning the mattress was another way the students could decrease vibrations, and Ms. Pino's engineering focus was on that design aspect of the project. The team also investigated several types of polymers and selected polyacrylate, a diaper gel, for its thermal conductivity and potential to remove 99% of the vibrations not eliminated by the suspension system. Traditionally, nurses and EMTs have had to use the side access door as a temporary bed when they need to work on the baby during transport. CSU's redesigned NTI also included a retractable sliding mattress tray that allowed optimal access to the neonate while maintaining its comfort and safety.

Straps and buckles used in conventional restraint systems can also damage a neonate's skin, and not all NTIs even have restraint systems. After talking with medical teams, the students decided to design a new type of restraint system that was adjustable, had fewer pressure points, and permitted access to the umbilical line. They determined that a restraint system using two straps – one over the chest and one over the upper thighs – provides better protection and eliminates the possibility of the infant choking if it moves.

Another area the medical teams asked the students to address was excess noise, which is not only distressing to infants but can also damage their hearing. A neonatal incubator is covered by a transparent shelter, or Isolette. The standard Isolette is rectangular in shape, and the team wanted to redesign it to further reduce noise levels and improve accessibility.



From left to right: Daphen Pino, Jennifer McHenry, Stacey Hill, Amy Hermundstad, Jennifer Serrao, and Nicole Ward

Combined with the energy, creativity, and enthusiasm of a dedicated group of engineering students, this newly-designed system has the potential to help the worlds' youngest and most vulnerable citizens.



Bridge to the Doctorate News

Colorado School of Mines is very proud to host the 2010-2012 COAMP Bridge to the Doctorate! CSM and professors, Dr. Linda Figueroa and Dr. Junko Munakata-Marr, welcomed eleven Bridge to the Doctorate Fellows to the CSM campus. Dr. Eric Dickenson and Jahi Simbai along with Dr. Figueroa and Dr. Munakata-Marr meet bi-monthly with Fellows to discuss their program and future goals. Below are highlighted activities from a few of our BD Fellows:



Susana Macias

Program: Environmental Science and Engineering

Research Project: Passive biological treatment of mine influenced water, specifically design and application of organic substrate for bioreactors.

Undergraduate: Environmental Engineering – University of Colorado at Boulder.

Highlights: Student representative volunteer for Native high school students visiting CSM campus; student college guide for Expanding Your Horizons Conference to promote careers in Science and Engineering for middle school girls; volunteer at Boulder County Health and Human Services tutor/mentor program working with girls in 2nd and 5th grade.

Program: Environmental Science and Engineering

Research Project: Application of membrane separation processes for unconventional water reuse.



Kerri Hickenbottom

Undergraduate: BS Civil Engineering - University of Nevada-Reno

Highlights: Member in the Society of Women Engineers and Engineers without Borders. Volunteers in K-12 outreach on CSM campus and outreach to underrepresented/minority high school students interested in pursuing STEM fields.

Program: Engineering with a Mechanical Specialty

Research Project: Development of microchannel reactors to create gas to liquid fuels using Fischer-Tropsch Synthesis.

Undergraduate: BS Chemical Engineering - University of Colorado at Boulder.

Highlights: Summer REU at Virginia Polytechnic Institute conducting experiments on the effect of graphite type on bipolar plate composites for PEM fuel cells.



Margarite Parker

Program: Applied Chemistry with Environmental focus.

Research Project: investigation of aggregation properties of engineered nanoparticles for insight into nanoparticle fate and behavior in the environment.

Undergraduate: Chemistry, minor in Bioengineering and Life Sciences - Colorado School of Mines.

Highlights: Completed internship in the forensic chemistry laboratory of the Colorado Bureau of Investigation. Volunteer at MESA wind energy competition and elementary/middle school science fairs. Math and Chemistry student tutor.



Manuel Montano

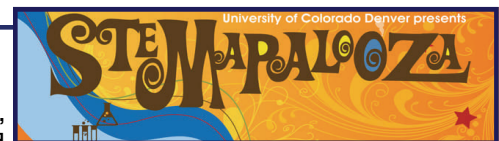
STEMapalooza

STEMapalooza offers tools to engage students in science!

STEMapalooza was held Oct. 8-9, 2010, at CO-AMP partner institution, University of Colorado Denver. This year, STEMapalooza welcomed more than 11,000 participants in an effort to put STEM (Science, Technology, Engineering and Math) in the spotlight. Exhibitors from all over Colorado came to display the latest innovations and engage students in science. Students were able to participate in hands-on activities, including video-game creation, examining the "Jungle Lady's" creatures, microscopic exploration and planetarium domes.



UC Denver Chancellor Jerry Wartgow summed up the event's success, "The event has really grown and developed, and the kids love it." Wartgow looks forward to seeing the positive impact events such as STEMapalooza will make on students across the state, as well as on the next generation work force and economy in Colorado.





CO-AMP Student News

239th American Chemical Society National Meeting: San Francisco, CA

Five Adams State College chemistry students participated in “Chemistry for a Sustainable World” at the 2010 ACS national conference where technical sessions were presented on cutting-edge research discoveries in chemistry and other related fields such as medicine, health, food, energy and the environment. A wide array of networking opportunities including, continuing education activities, specialized student programs, governance activities and employment counseling were also highlights. The meeting’s multidisciplinary symposia provided an opportunity to educate attendees about current sustainability initiatives and how to use chemistry to improve our global environment. Wendi Marquez presented a poster, “Using surface plasmon resonance for an open-inquiry instrumental laboratory.” Rachel Raguindin presented a poster based on a project in collaboration with Colorado State University professor, Dr. Steven H. Strauss, and Dr. Olga V. Boltalina titled, “Separation of C60 Derivatives Carrying Perfluoroalkyl Substituents Using High Performance Liquid Chromatography.”

COAMP students, Reyna Reyes, Mario Padilla, David Gurule, and Rachel Raguindin, at the exposition at the national American Chemical Society Conference in San Francisco.

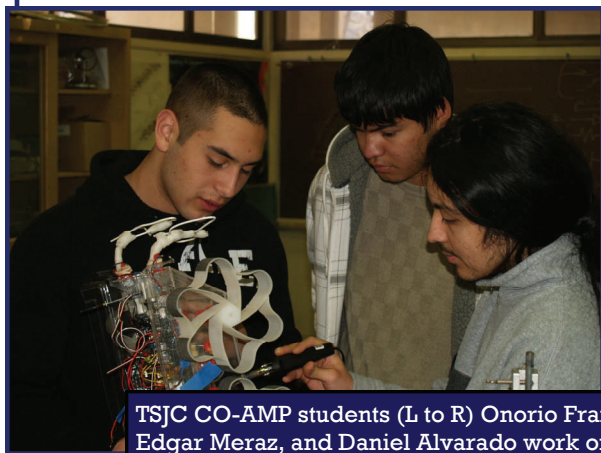


Wendi Marquez presenting her poster: “Using surface plasmon resonance for an open-inquiry instrumental laboratory” at the ACS national conference.

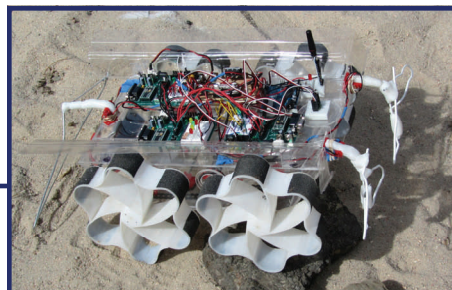


4th Annual Colorado Robot Challenge in Alamosa, CO

CO-AMP students at Trinidad State Junior College and Colorado State University – Fort Collins built and entered robots for the fourth annual (NASA judged) Colorado Robot Challenge. Out of eleven entries from seven schools, only two finished Course 1, TSJC and CSU - Fort Collins. Of all the entries, only TSJC’s robot was built from raw materials (other robots were either remote-controlled toys or built from erector sets), and at the end of the competition, only robots from two schools – TSJC and CSU-Fort Collins – were still functioning! TSJC’s robot was later used at Career DAY STEM demonstrations.



TSJC CO-AMP students (L to R) Onorio Franco, Edgar Meraz, and Daniel Alvarado work on their entry for the Colorado Robot Challenge.





CO-AMP Student News (continued)

CSU SACNAS - Chapter of the Year

The Society for Advancement of Hispanics/Chicanos and Native Americans in Science, or SACNAS, has honored Colorado State University with the Chapter of the Year Award for chapters of 30 members or less. Colorado State is one of only six chapters out of 53 to be recognized by the organization this year.

The award was based on numerous factors including:

- leadership development and overall cohesiveness of the chapter
- the chapter's extensive facilitation of the Rocky Mountain Regional Meeting
- mentoring and tutoring with the Colorado Science and Engineering Fair and the Triunfo/Triumph Leadership Program – a partnership that matches undergraduate CSU tutors with underserved K-12 students in the Poudre School District
- involvement and funding support of Colorado Alliance for Minority Participation, which aims to increase the number of ethnic minorities seeking bachelor's degrees in Science, Technology, Engineering and Mathematics, or STEM, disciplines.

"The committee was especially impressed with how the chapter connected and partnered with various departments and programs within CSU and with other SACNAS chapters in Colorado," said Tanya Beat, national chapter program manager for the organization. "Each area of strength supports the overall mission of SACNAS by promoting the attainment of advanced degrees in science, math and engineering by Hispanics/Chicanos and Native Americans."



Presenting the SACNAS Chapter of the Year award to Arlene Nededog (right) is Dr. Lino Gonzalez, Scientist at Genentech.



"This is a great honor for the chapter and for Ms. Nededog, whose team works tirelessly to connect people from all racial, ethnic, and professional backgrounds and encourage ethnically diverse students to pursue advanced degrees in science and engineering, preparing them for leadership in research and teaching careers."

— Colorado State University
Provost and CO-AMP PI
Rick Miranda



SACNAS

"Advancing Hispanics/Chicanos & Native Americans in Science"



International Connections: CO-AMP Students Travel to Costa Rica and Laos for Summer Internships



Jaymus Lee (right), Jennifer Ulrich (left, bottom) and Audrianna Lee (left), all CO-AMP students at Fort Lewis College, participated in NSF's NAPIRE (Native American and Pacific Islander Research Experience) 2010 program at the Las Cruces Biological Station to study tropical biology in Costa Rica. Based at Organization for Tropical Studies (OTS) Field Stations, this undergraduate course provided access to a broad array of tropical ecosystems, including lowland wet forest at La Selva, dry forest, and wetlands at Palo Verde, and premontane moist forest at Las Cruces. This international experience also included tropical ecosystem design, implementation, and interpretation which prepared students to conduct their own independent research projects.



Jaymus Lee (right), Jennifer Ulrich (left, bottom) and Audrianna Lee (left), all CO-AMP students at Fort Lewis College, participated in NSF's NAPIRE (Native American and Pacific Islander Research Experience) 2010 program at the Las Cruces Biological Station to study tropical biology in Costa Rica. Based at Organization for Tropical Studies (OTS) Field Stations, this undergraduate course provided access to a broad array of tropical ecosystems, including lowland wet forest at La Selva, dry forest, and wetlands at Palo Verde, and premontane moist forest at Las Cruces. This international experience also included tropical ecosystem design, implementation, and interpretation which prepared students to conduct their own independent research projects.



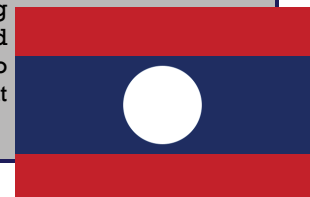
Two CSU CO-AMP students, Nicole Kenote (sophomore in biomedical science, at left, and bottom left) and Deidra Newbrough (junior in environmental health, bottom right) traveled to Costa Rica this summer as part of an internship program sponsored by the Tropical Studies (OTS). OTS is a nonprofit organization that provides leadership in education, research and the responsible use of natural resources with a primary focus on the tropics. Ms. Kenote and Ms. Newbrough participated in the NAPIRE Program, which is designed specifically to expose Native American and Pacific Islander undergraduate students to the biodiversity of the tropics. The students worked with industry leaders to conduct hands-on research based on data gathered in the field and worked with professors in designing, implementing and interpreting data based on research models they developed during the course of the internship. At the end of the summer, students presented their research findings in formal reports and oral presentations.

Two CSU CO-AMP students, Nicole Kenote (sophomore in biomedical science, at left, and bottom left) and Deidra Newbrough (junior in environmental health, bottom right) traveled to Costa Rica this summer as part of an internship program sponsored by the Tropical Studies (OTS). OTS is a nonprofit organization that provides leadership in education, research and the responsible use of natural resources with a primary focus on the tropics. Ms. Kenote and Ms. Newbrough participated in the NAPIRE Program, which is designed specifically to expose Native American and Pacific Islander undergraduate students to the biodiversity of the tropics. The students worked with industry leaders to conduct hands-on research based on data gathered in the field and worked with professors in designing, implementing and interpreting data based on research models they developed during the course of the internship. At the end of the summer, students presented their research findings in formal reports and oral presentations.

Organization for



Fort Lewis CO-AMP student Rachel Medina (at left) works to build a water system in Ban NamHom, Laos as part of the Engineers Without Borders program. Rachel's responsibilities included intake for the system at the water source, collecting GPS data and gathering drinking water. "Being a part of this experience has affected my life forever. I think that having the chance to do these projects and build lasting relationships is what really makes sustainability," Medina said.





Steering Committee Meeting Spring Meeting at Denver Metro

April 9, 2010

The Spring CO-AMP Steering Committee meeting was hosted by Dr. Larry Johnson of Metropolitan State College of Denver, on April 9, 2010. CO-AMP members were welcomed by Dr. Johnson and Dr. Ernest Chavez, Co-PI. Guest speakers included: Randy Fischer, Colorado State Representative and Deputy Majority Whip from District 53; Dr. Caesar Jackson, National Science Foundation Acting Division Director Human Resource Development/Education and Human Resources; and Dr. Omnia El-Hakim, National Science Foundation Program Director for Diversity and Outreach, Directorate for Engineering. Representative Fischer focused on the challenges surrounding higher education funding in Colorado. Both NSF speakers highlighted broadening participation and expanding outreach in STEM fields. Other presentations included: SACNAS Student Chapter president from Metropolitan State College of Denver, Ian Brown; Student representative from Center for Math, Science and Environmental Education at Metropolitan State College of Denver, Monica Knox; Colorado Mathematics Engineering Science Achievement (MESA); and the Colorado School of Mines Humanitarian Engineering Program.



Steering Committee work session



Colorado State Representative
Randy Fischer



(Left to right) Drs. Beverly Marquart, Ernest Chavez, Omnia El-Hakim, Caesar Jackson and Rick Miranda



Metropolitan State College student representatives:
Monica Knox and Ian Brown



Announcements!

STEERING COMMITTEE MEETING

**April 8, 2011
Hosted by
Colorado State University — Pueblo
Pueblo, CO**



**Featured Guest Speaker:
Sylvia Celedon-Pattichis**



**Associate Professor of Bilingual Education –
University of New Mexico
Department of Language, Literacy, and
Sociocultural Studies
Co-Principal Investigator, Center for the
Mathematics Education of Latinos/as (CEMELA)**



NSF JOINT ANNUAL MEETING

JAM Conference

**June 5th-8th, 2011
Washington, DC**



DR. FRASER HONORED WITH LIFETIME ACHIEVEMENT AWARD

Dr. Jane Fraser, chair of the engineering department at Colorado State University-Pueblo and CO-AMP site coordinator, was honored as the inaugural recipient of the Lifetime Achievement Award by the Industrial Engineering Division of the American Society of Engineering Education (ASEE) at its 2010 national conference in Louisville, KY.

As a woman engineer, Fraser has developed an understanding of what it means to be treated differently and has applied that understanding to help others succeed. She has chaired CSU-Pueblo's Multicultural Council and was a member of the Coordinating Committee for Women's Studies at CSU-Pueblo.

"I am honored to receive this award – and also motivated. As a woman in engineering, I know what it is like to feel discouraged, and this recognition from my national colleagues tells me to continue to help students achieve their best," Fraser said.



GOVERNING BOARD MEETING

May 6, 2011

**Hosted by
Colorado School of Mines
Golden, CO**





CO-AMP Site Coordinator Team

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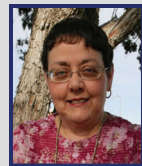
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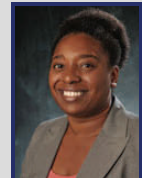


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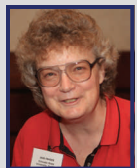


Colorado State University – Pueblo

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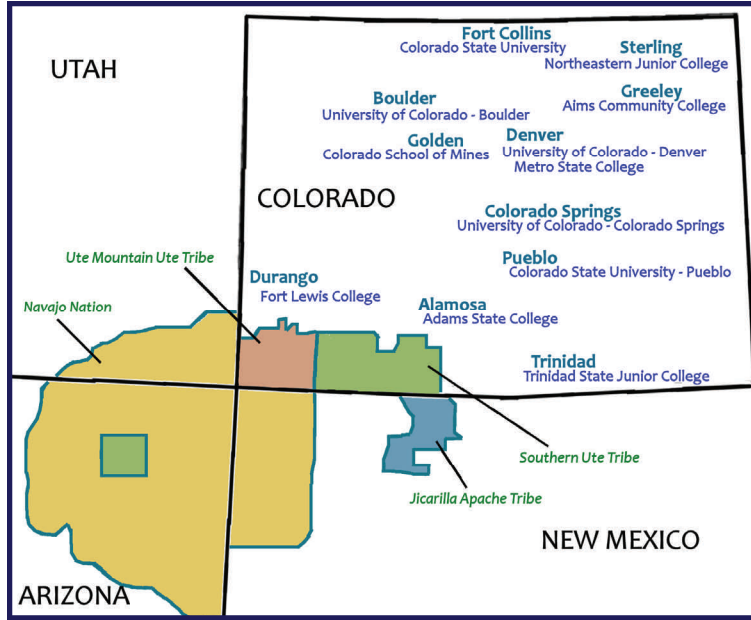
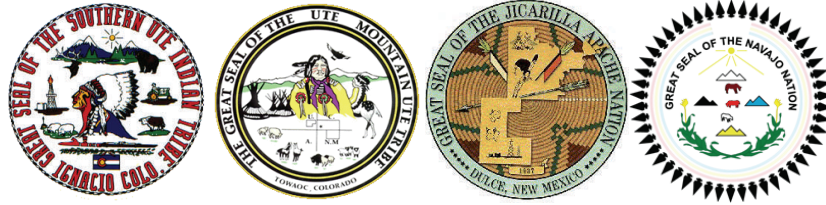
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CO-AMP COMMENTARY

Serving Colorado and the Four Corners Region



UNIVERSITY OF COLORADO DENVER



CO-AMP Industry Partners



Ball Aerospace
LaKenya Brown
Rob Markovic
Sunil Mavadia



Hewlett-Packard
Sonia Brocko

NREL National Renewable Energy Laboratory
Fannie Posey-Eddy



Seagate Technologies
Chris Porter



Boeing
Gloria Bradway
Dona E. Wallace



IBM

Eastman Kodak
Greg Smith



AMD
John Wu

El Paso Corporation
Kelley Hicks
Rob Ferguson



Note from the Director:

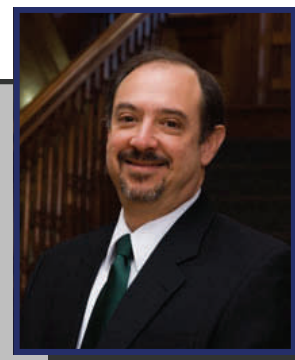
Dear CO-AMP Colleagues and Friends,

Scientific and technological advances have become increasingly important to our country as we face the benefits and challenges of both globalization and a knowledge-based economy. The development of education in science, technology, engineering and mathematics (STEM) remains one of our country's greatest assets. However, even though underrepresented minority STEM students have made gains in college enrollment and the number of degrees they have earned in recent years, the gap between their college success rates and those of non-minority students still exists. Since its inception in 1995, CO-AMP has worked diligently to close this gap by integrating minority students into college life; initiating early STEM advising and mentoring programs; providing support for students' needs; and increasing communication of effective programming across its partner institutions. CO-AMP has taken a broad approach to further reducing our attrition rates by engagement programs and activities that assist students in developing a scientific identity. For many minority students, this means linking the study of science to how society may benefit and how they can take what they learn back into their communities. It is CO-AMP's ultimate goal to continue to close this gap by working together with all of our partner institutions through formal and informal settings to make this a reality.

We are very proud of CO-AMP's accomplishments including the 2010-2012 Bridge to the Doctorate (BD) award to Colorado School of Mines from the National Science Foundation. BD funding has enabled Colorado School of Mines to attract and support talented underrepresented minority students who are interested in pursuing doctorate degrees in cutting-edge graduate research programs. We look forward to great successes from our BD Fellows!

Hence, it is with great pleasure that I share this newsletter highlighting some of CO-AMP's accomplishments! Although it's impossible to feature every success, it is my hope that this newsletter will serve as a resource, as well as a tribute, to our growing network of dedicated individuals who through commitment and tireless effort support CO-AMP students each and every day!

Dr. Rick Miranda



Dr. Rick Miranda
*Principal Investigator
and Director of
CO-AMP
CSU Provost/Executive
Vice-President*