

Horizons

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

Expanding the Community College Research and Transfer Experience

In a state of 1,928,384 people (U.S. Census Bureau estimated population/2005) spread across 121,593 square miles, serving the educational needs of widespread community college students is a challenge. The restrictions of time, distance and money must take a back seat to meeting the goals of New Mexico AMP and providing the opportunities for the STEM students who want to accept them. New Mexico AMP is redoubling its efforts on behalf of the community colleges with two projects directly targeting those students.

Past issues of Horizons carried articles about the META program (Minority Engineering Transfer and Articulation) which partnered Santa Fe Community College, Luna Community College and New Mexico State University for summer research experiences for Civil Engineering majors. The META program has now evolved into META/SCCORE (Summer Community College Opportunity for Research Experience).

This summer program targets community college students in all STEM fields, providing research opportunities, fostering student success, and assisting students in the transition to a New Mexico AMP four-year institution.

Announced statewide, students from Luna Community College, Northern New Mexico Community College, NMSU-Grants branch and NMSU-Alamogordo participated in the 2005 program. While on the NMSU campus, students were housed on campus for eight weeks and attended a credit-bearing seminar that provided campus orientations and workshops detailing the available social, financial, and academic support thus helping them to understand the transfer process and contributing to their professional development. Key to the program was the research assistantships. Students worked in a faculty mentor's lab, investigating and collecting data. Writing strategies and techniques were taught as workshops in which students each created a

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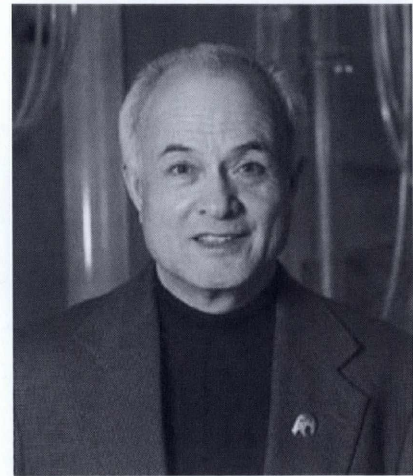
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From the Director

This issue of Horizons debuts the new NMSU color palette, but the content of our New Mexico AMP newsletter is the same as we again recognize some of the students and faculty partners who contribute to our success.

In addition to the awards noted in the newsletter, New Mexico AMP offers its congratulations to Vicente Lombrana, NMSU-Alamogordo, one of the newly named 2006 Regents Professor Master Teachers. Lombrana is an academic leader in the field of biology. His teaching recognitions include two Donald C. Roush Awards for Teaching Excellence in 1995 and 2001, two NMSU-A Teaching Excellence Awards in 1997 and 1999 and two National Institute for Staff and Organizational Development Teaching and Leadership Excellence Awards in 1995 and 1998. Lombrana is a past Institutional Coordinator for New Mexico AMP.

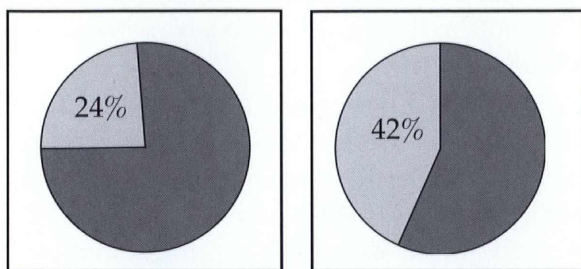


Also honored was current Institutional Coordinator Bette Berry, college professor in mathematics at NMSU-Alamogordo who received a 2006 Donald C. Roush Excellence in Teaching Award. The Roush Awards are named in memory of Donald C. Roush, a former executive vice president, in recognition of his 35 years of teaching improvement in New Mexico. The honor is based on information gathered from students and recommendations from department heads, deans and provosts.

As well as celebrating the accomplishments of our faculty, we can celebrate another increase in the number of STEM degrees awarded; the 36 Bridge to the Doctorate students being assisted through their Master's Degree and on to the Ph.D. (with another cohort in development), and our 2005 conference with 360 participants including representatives from five LSAMP programs outside New Mexico. Once again, thank you to the students, faculty, staff and friends who contribute to making our efforts succeed.

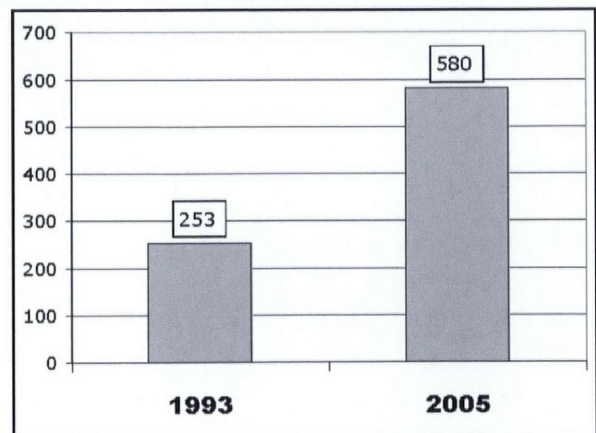
*Ricardo B. Jacquez, Ph.D. P.E.
Director*

New Mexico AMP reported the following to NSF for the academic year ending 2004-2005:



1993 => 2005

In 2004/2005, 42% of STEM degrees were awarded to underrepresented students, up from 24% in 1992/1993.



The 580 degrees awarded in 2005 brings the total number of STEM degrees awarded over the life of the New Mexico AMP program to 5,269 degrees.

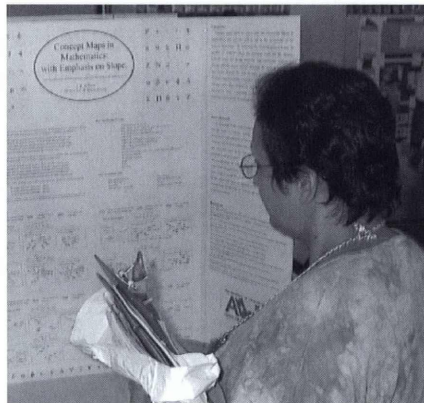
People, Places, and Things

New Mexico Tech student Henry Jauregui (Physics) participated in the Wireless Integrated Micro-Systems (WIMS) summer Research Experience for Undergraduates (REU) program based at the University of Michigan in Ann Arbor where he worked with Steve Kim primarily on the Micro-machined Acoustic Ejector Array (MACE) device and also on a micro-pump being developed for a micro gas chromatograph. The MACE device is being developed for possible micro-device propulsion as well as cooling applications. Jauregui's work included testing for resonance frequencies of the system, measuring air velocity and thrust, and testing for cooling ability. His contribution to the ongoing research has led to a paper submission to the IEEE MEMS conference being held in Turkey later this year. WIMS is led by the University of Michigan in partnership with Michigan State University, Michigan Technological University, and other schools nationwide.

University of New Mexico-Gallup Assistant Professor of Chemistry and New Mexico AMP Institutional Coordinator Dr. Kamala Sharma has been named recipient of the 2005 Society for Advancement of Chicanos and Native Americans in Science award. She was formally recognized at the annual meeting of SACNAS in

Denver September 29-October 2, 2005. Sharma has been active in a National Institute of Health-supported Bridge Program which fosters the transition of American Indian students from community colleges to four-year institutions for completion of the Bachelor of Science degree. Dr. Glenn D. Kuehn, a colleague of Sharma's from New Mexico State University said, "Her transferred students are completing B.S. degrees with 48 percent success... better than twice the national rate of B.S. degree-completion for all American Indian students in all disciplines."

(Information courtesy of: <http://www.gallup.unm.edu/aboutus/newsevents/20050829sharma.php>)



Dr. Kamala Sharma, UNM-Gallup, and recipient of the 2005 SACNAS award, judges a poster at the New Mexico AMP conference

Former New Mexico AMP Institutional Coordinator Anthony Sena, a 24-year veteran biology instructor and science department Chairman at Northern New Mexico College,

has been named the school's first Provost. In 1999, Sena was named to Eastern New Mexico University's Science Alumni Hall of Honor and received a national SACNAS community college mentoring award. With collaboration and support from staff and faculty at the Los Alamos National Labs and the University of New Mexico, Sena has pursued research in molecular genetics and his Ph.D. in biomedical science from UNM's school of medicine.

(Information courtesy of Public Information Office, Northern New Mexico College, 9/5/05)

Award winning research was presented by AMP students at the 2005 Society for the Advancement of Chicanos and Native Americans in Science (SACNAS) National Conference held in Denver, Colorado, in October. Daniel Candelaria (NMSU) received a Graduate Student Oral Presentation Award in Engineering; students Ana Isabel Parra, Britney Candia, and Patrick Ventura, Biological Sciences majors at the University of New Mexico, and Michelle Tsinnajinnie, a Biological Sciences major at the UNM-Gallup campus, received Undergraduate/graduate Student Poster Presentation Awards. Jason Griego, also a Biological Sciences major at the University of New Mexico, received an Honorable Mention.

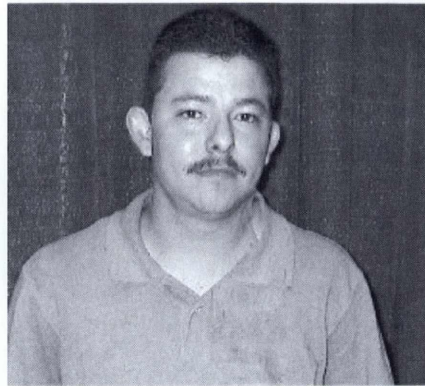
People, Places, and Things (cont) . . .

Jafet Gonzales* would advise all engineering students to take an internship position, including students who do not plan for a career in industry. "There is no perfect job," Gonzales said, "There will always be challenges anywhere you go." Working as an intern in fast-paced production and dealing with deadlines, contractors, and government agencies on a daily basis "will give you an edge" in any type of work environment, he believes.

The former Undergraduate Research Assistant worked for the Nestle plant in Chatsworth, California, during the summer of 2005. He quickly found that motivation, leadership, fast thinking, and the ability to adapt to change are important skills for working in an industry environment like Nestle. Working with the Food and Drug Administration proved to be his biggest challenge because FDA guidelines factor into all aspects of technology and production.

When working on projects, Gonzales often found himself balancing the prerogatives of different departments, FDA regulations, and plant contractors. "It is just a rule of thumb: one of your contractors is not going to come through," he said. At the same time, Gonzales explained, "Production is your bread and butter; you can't stop production."

Needless to say, Gonzales' organizational skills improved: "I learned how to manage my time a lot better. When you're in an



Jafet Gonzales

environment like that, you have so many things to do. When I actually go back to school it will be a lot easier."

Gonzales accepted a position with Nestle starting after his graduation in December 2005, when he received his B.S. in mechanical engineering. He will work with industrial engineers at Nestle to approve, introduce, test, and modify new production line technology. He plans to work for Nestle for two years before going back to school for his MBA.

(story by Danielle Deemer, Editorial Assistant)

**Note: This is a follow-up to an earlier article about Gonzales just before he left for the Nestle internship.)*

As a lifelong resident of Las Cruces, Felicia Guerrero felt hesitant at first about leaving for her General Motors internship in Lansing, Michigan. After her great experiences there in the summer

of 2005, however, she was reluctant to return home.

Guerrero was surprised at how prepared she felt to perform her job as a finite element analyst. One of her first projects involved testing a center console for passenger stresses in a 2008 vehicle. "I had to simulate a 250 pound man standing on the console, because people might like to stand on it and wave out the sunroof like they're a beauty queen," she explained. She gained some of her best experience and insight while working cooperatively with other engineers to account for these possible consumer abuses.

Guerrero decided to take an internship position in industry because she believes real world experience will add to her skills and credentials if she decides to teach.

Guerrero said GM is a good place to do an internship because they value diversity as well as family. "They understood how far from home I was," Guerrero explained, "and they said they'd understand if I needed to take any trips back home." GM additionally provided her with fully furnished living facilities.

Guerrero returned in August to complete her B.S. in mechanical engineering. This semester she is also developing a Web CT course with Bobbie Green and Ed Pines about Global Sullivan Principles of Corporate Social Responsibility,



Felicia Guerrero

the “values a corporation should live by,” she explained.

Reverend Leon Sullivan, the first African American to serve on the GM advisory board, recommended a set of humanitarian ethics for corporations everywhere. Working at GM, Guerrero found the employee handbook did not explicitly list the Principles. When she explained the importance of the Sullivan Principles and asked that they be outlined, GM complied and listed the values on their website. The Web CT course will be available to both business and engineering students.

GM offered Guerrero a position but she chose to continue her education in a PhD program. “I don’t know where and I don’t know what, but I know I want to do it,” she said.

(story by Danielle Deemer, Editorial Assistant)

In July, 2005, New Mexico AMP received funding for a third NSF Bridge to the Doctorate cohort. The Bridge to the Doctorate is designed for NSF Alliance for Minority Participation students who have completed the B.S. degree in a science, engineering or mathematics discipline, and have identified the Ph.D. as their educational goal.

This third cohort will support 12 engineering and science graduate students. These 12 will join the 24 graduate students already in the first two cohorts. Cohort 1 is comprised of 11 engineering graduate students; Cohort 2 supports 13 graduate students in engineering, chemistry, physics, mathematics, geology, and computer science. A third of each cohort began their research with a New Mexico AMP Undergraduate Research Assistantship, and most will credit that experience in developing and encouraging their interest in graduate school.

Bridge fellows have access to a variety of project components including financial support; faculty-mentored research; professional development workshops; involvement with the New Mexico AGEP Program; a graduate seminar that fosters success in graduate school and directs students to the Ph.D.; and other support elements, including editorial assistance with thesis preparation, networking with faculty, identification of additional fellowship opportunities, and travel assistance to professional conferences.



Bridge to the Doctorate Cohort I (back row left to right): Ricardo Jacquez, Director, Daniel Nayer, Albert Moncada, Jimmy Moreno, Ruben Ortega, Ryan Christopher, Thomas Dodge (front row): Frank Jurado III, Danielle Sanchez, Angela Chacon, Sergio Pizarro, and former BD coordinator Rose Peña (not pictured, Zachary Hendron)



Bridge to the Doctorate Cohort II (left to right): José Leo Bañuelos, Sarah Gibson, Ismael Nieto, Michelle Chavez, Lyle Young, Yvonne Torres, Daniel Candelaria, Iris Royal, Gloria Martinez, Alex Alvarado (not pictured, Vanol Francois, Antonio Serna)



Bridge to the Doctorate Cohort III (left to right): Rosie Talamantez, Andrew Blackman, Angelica Chacon, Alfredo Juarez, Jeremy Peña, Brady Rocks, Andrea Chavez Solis, Phillip Rivera, José Solis, Javier Cerna, Veronica Bunn (not pictured, Matthew Berry)

The NMSU Bridge to the Doctorate program is one of 16 nationwide and recruits students from all the NSF Alliance for Minority Participation programs.

poster presented at the Farewell Luncheon and at the New Mexico AMP Student Research Conference on October 7, 2005. For Danielle Miranda from NMSU-Alamogordo, the research experience was so successful that her summer mentor agreed to continue working with her after Danielle transferred to NMSU last fall.

The META/SCCORE program boasts a success rate of 77%, defined as participants who remain in school in a STEM discipline, and who are on track for transfer.

A second area of service, and new to the Student Research Conference for 2005, were pre- and post-conference workshops designed specifically for community college students who were new to the conference experience. The META/SCCORE students were part of these workshops, and presented their summer research at the conference poster competition.

The pre-conference workshop gave an overview of the conference and helped students to navigate conference materials and events. An important component of the workshop assisted students in reading and understanding the research presentation abstracts by guiding them through simple strategies, such as locating key words, considering the interesting aspects of the title, forming a general impression, and summarizing the purpose in their own words. This exercise helped to demystify the abstracts and enabled students to make sense of the abstracts on their own. This workshop enabled students to more knowledgeably plan their schedules for the following day's conference events and presentations.

At the post-conference seminar, facilitated by Dr. Tom Root, Senior Institutional Researcher at the University of New Mexico, students explored what they needed to do to prepare for academic work at a four-year institution, and got tools and advice on handling transfer and articulation issues. The workshop helped students plan their schedules and provided guidance on how to ensure that the credits students take will transfer to a four-year university.

Twenty-five students received a \$500 stipend for attending and presenting at the conference and for attending the pre- and post-conference workshops. They were also required to fill out a Participation Packet journal that asked them to record their observations as they attended their selected events and activities as part of a formative evaluation. This journal provided an opportunity for students to discover the specific steps they want and need to take in such areas as research, transferring to a university, and evaluating their current academic efforts and provided the impetus for goal-setting for their academic futures.

Students' comments included statements such as: "Being able to interact with researchers at all levels was valuable." "[The conference] is not just for a stipend, it gives us an experience to meet new people and learn some things." "This conference helped me realize



Danielle Miranda (center) works on her research project "Segregation of Mapping Population in Cotton: detected by AFLP Markers" with Dr. Jinfa Zhang's graduate students



META/SCCORE "Class of 2005"

even more that I need to transfer to a four-year school." These statements and others like them reaffirmed that, overall, the workshops established a more meaningful conference experience, promoted more commitment to achieving transfer, and helped close the gap between the community college and the university.

The combination of financial support, academic support, and guidance through the two-year/four-year transition period seems to be a major factor in building a student's confidence in their ability to transfer and succeed. New Mexico AMP will build on that by continuing to evolve the META/SCCORE project and conference workshops, and disseminating program information and opportunities to the community college network.

"Expanding Horizons II"

2005 Student Research Conference

The annual New Mexico AMP student research conference was held on October 7, 2005 at Corbett Center at New Mexico State University. The 360 in attendance included students and faculty from 12 New Mexico universities and community colleges, high school juniors, seniors, and advisors from the New Mexico MESA program; and students and faculty from LSAMP programs in New York, Connecticut, California, Missouri, and Oklahoma.

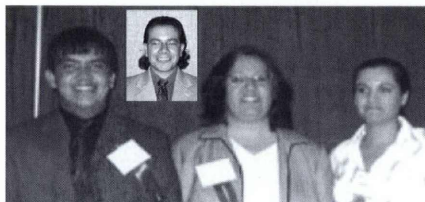
Sixty-nine students presented their faculty-mentored research projects. All presenters received a certificate and embroidered stadium blanket. First, second and third place winners also received a plaque and monetary award.

The conference opened with remarks from NMSU President Michael Martin, College of Engineering Dean Steve Castillo, and New Mexico AMP Director Ricardo Jacquez. The luncheon speaker was Linda Taylor, Manager of Diversity and Compliance, Raytheon Missile Systems, Tucson, Arizona. Lunch was followed by an NMSU faculty research poster fair. Concurrently, conference participants viewed the student poster research presentations, and visited NMSU student service information tables.

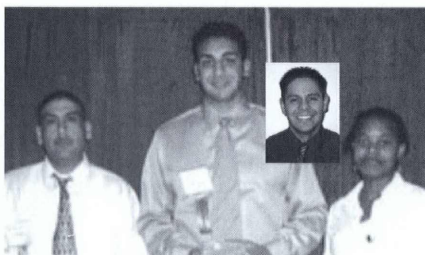
A mini-trebuchet building competition was held for the

New Mexico MESA students while community college and university students attended a panel discussion with representatives from industry and government organizations on the need for students to excel in their technical field, but also to be flexible and ready to adapt to a constantly changing global economy.

The conference ended with the awards banquet where best oral and poster presentation winners were announced.



Oral competition winners were: First place: Ernesto Santillano and José Solís [inset], Civil Engineering (team presentation, NMSU); Second place: (not pictured) Henry Jauregui, Physics, (New Mexico Institute of Mining and Technology); and Third place (tied): Elaine Manzanilla, Biological Sciences (California State University-Sacramento) and Yessenia Ibarra, Biology (San Diego State University)



Poster competition winners were: First place (tied): Nathan Padilla, Biology (ENMU) and Samy Saker, Biochemistry (College of Staten Island); Second place: Jeremy Peña, Mechanical Engineering [inset], (NMSU); and Third Place: Maria Jacob, Biological Sciences (University of Connecticut)

Mark your
calendar
now for the
2006
New Mexico
AMP
Student
Research
Conference!

October 6, 2006

Pre-and post conference
workshops for New Mexico
Community College students
on October 5 & 7.

On-line registration opens
April 3, 2006.

[www.nmsu.edu/~nmamp/
conference](http://www.nmsu.edu/~nmamp/conference)

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