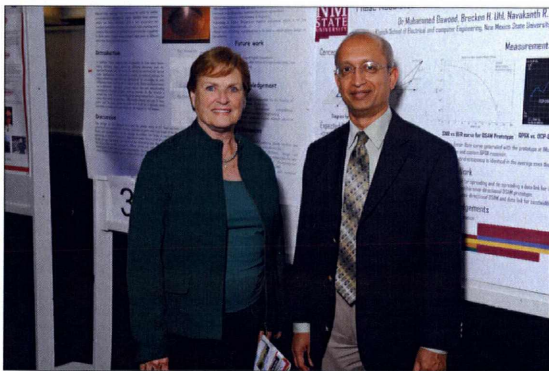


# Horizons

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

## *Expanding Horizons: The Importance of Mentorship, or 'Giving Back What You Were Given'*



*New Mexico State Senator Mary Kay Papen, Conference Luncheon Speaker, and Dr. Vimal Chaitanya, NMSU Vice President for Research, Graduate Studies/International Programs take time to view the posters at the conference.*

Over 400 New Mexico AMP community college and university students, staff, faculty, and administrators, along with representatives from the New York City, Ohio, and Texas LSAMPs and from Chihuahua, Mexico, attended the 2008 New Mexico AMP Student Research Conference at New Mexico State University (NMSU) on October 3rd. In addition, high school juniors, seniors, and advisors from the New Mexico Math, Engineering, Science Achievement, Inc. (New Mexico MESA) program attended the event.

Jacob Urquidi, Assistant Professor of Physics at NMSU, delivered the Keynote Address. Dr. Urquidi, born and raised in El Paso, Texas, discussed his current research that involves instrument and software development and the use of X-ray and neutron beams. Focusing his presentation on the importance of mentoring, Dr. Urquidi shared his own journey that has been encouraged and enhanced by very significant mentors from high school to his tour as a Marine and afterward, to his Ph.D. Without these mentors, Urquidi noted, he would not have accomplished all he has. He shared his own academic struggles, encouraging the students to persist, to seek good mentors, and to learn to ask questions, an essential skill that takes practice.

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# From the Director . . . . .

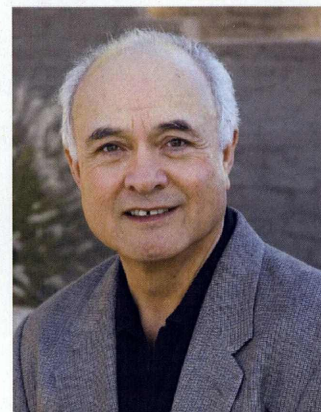
This has been another active and encouraging year for New Mexico AMP, with new challenges and fresh areas of focus, in addition to the demands and exciting growth of our continuing programs, activities, and events. Our statewide alliance continues to impact the participation of New Mexico's students in progressive research and in undergraduate and graduate school and beyond. We kicked off with the New Mexico AMP Student Research Conference in October 2008 and are now planning for summer events and program activities and the Conference in the fall of 2009. You'll find information about the 2009 conference on this page and an overview of the 2008 conference on pages 1 and 4.

One of the highlights of this year was the meeting in Washington, D.C. on Feb. 23-24 that was held to provide input to NSF on collaborations between tribal colleges (TCUs) and four-year universities that have effectively increased opportunities for Native American students to pursue degrees in engineering. The discussion focused on assisting more TCUs to establish and offer pre-engineering programs that encourage transfer to the universities for completion of the B.S. degree. Strategies for facilitating successful collaborations included creation of cohorts of students; development of innovative curriculum, such as offerings of math in modules vs. traditional semes-

ter-based teaching; research mentoring for TCU faculty and students by university faculty; faculty exchange between TCUs and universities; and establishment of intervention programs at the universities for support of TCU students during their first two years of pre- and post-transfer. Attending the meeting were NSF staff, faculty, and staff from TCUs and universities nationwide, as well as individuals with expertise in tribal culture and measuring student success.

There has been a strong effort this year to broaden our international focus, and on page 3, you can read about our collaboration with the University Autonomous of Chihuahua and some events in which our students, faculty, and staff participated. We look forward to further collaborative efforts in our initiative of an Academic Network of Collaboration.

Institutional Coordinators (ICs) from ten institutions attended a statewide Institutional Coordinators Meeting in Albuquerque in Feb., 2009. At the meeting, staff members led discussions, and ICs presented brief profiles of their institutions. Dr. Laura Crossey, UNM IC and Bridge to the Doctorate Director, presented a brief report about the cohort, followed by an overview of the New Mexico AMP project evaluation by Dr. Lisa Frehill, Director, Commission on Professionals in Science and Technology (CPST). Dr. Frehill presented strategies of collection and reporting of data.



Ricardo B. Jacquez, Ph.D. P.E., Director of New Mexico AMP

This is an outstanding alliance, and I am amazed by and grateful for your tireless and unfaltering commitment to our students. Through your efforts, students, faculty, and institutions are being impacted. I look forward to seeing you at the 2009 Conference!!

**Mark Your Calendar Now . . .  
for the 2009 New Mexico  
AMP Student Research  
Conference on  
October 2, 2009!!**

Visit the New Mexico AMP  
Conference website at  
[www.nmsu.edu/~nmamp/conference](http://www.nmsu.edu/~nmamp/conference)

On the website, you'll . . .

- Learn about conference activities and see the agenda.
- Find information about oral and poster presentations, including presentation categories, submission deadlines, and presentation formats.
- View judging criteria for oral and poster competitions.
- Register on the Registration Page: You will be asked if you are a student presenter and if you are, a second page will show where you can submit your abstract and presentation information.

*Note: Pre-and post-conference workshops for community college students on October 1st and 3rd.*

# People, Places, and Things . . . . .

The fourth annual Summer Community College Opportunity for Research Experience (SCCORE) program was held at New Mexico State University in July, 2008, awarding scholarships to ten (10) community college students. Participating in the program were students from San Juan Community College, Santa Fe Community College, Central New Mexico Community College, NMSU-Alamogordo, and University of New Mexico-Gallup. The program is designed to help students explore academic and career opportunities, provide a faculty-mentored research experience, and assist students in transfer. In the 2008 program, students participated in workshops, student and faculty panels, campus orientations, events with other New Mexico AMP program participants, and a credit-bearing course.

The Bridge to the Doctorate Cohort VI program is currently being held at the University of New Mexico (UNM). The Project Director for the program is Dr. Laura Crossey, Professor of Earth and Planetary Science and New Mexico AMP Institutional Coordinator. Majors of students in the program include Earth and Planetary Sciences, Chemical and Nuclear Engineering, Chemical Engineering, Civil Engineering, and Electrical Engineering. The cohort will attend the Joint Annual Meeting (JAM) in Washington, D.C. in June, 2009.

NMSU Interim President Waded Cruzado, Provost Robert Moulton, New Mexico AMP Co-Director Dr. Delia Valles, and staff member Dr. Imelda Olague joined three Bridge to the Doctorate students at the International and Intercultural Education Fair and Forum in Chihuahua, Mexico from October 16-18, 2008. The event provided a forum for international and intercultural educators to share ideas and best practices and to develop connections and partnerships. The event offered panels comprised of campus presidents and other dignitaries from the U.S., Mexico, Brazil, Venezuela, Peru, China, Japan, and Spain. More recently, Dr. Olague joined other NMSU students, staff, and faculty at the University Autonomas of Chihuahua on March 6, 2009 to initiate an Academic Network of Collaboration and an international research experience for undergraduate students.

Southwestern Indian Polytechnic Institute (SIPI), a New Mexico AMP partner, is a National Indian Community College and Land Grant Institution serving American Indians and Alaskan Native students. Besides the New Mexico AMP program, there are other grant programs that benefit SIPI students, among them the Tribal Colleges and Universities (T-CUP) program and the Advanced Technological Education (ATE) program. Dean Pershall, Chair of Advanced Technol-



Above: SCCORE 2008 Participants that hail from UNM-Gallup, Central New Mexico CC, Santa Fe CC, NMSU-A, and San Juan College.



Bridge to the Doctorate Cohort VI at UNM: Front row (L to R) Kareen Pade, Brandi Cron, Maria Leyva, Manuel Rivera; Back row (L to R) BD Co-ordinator Dr. Laura Crossey, Bayo Falase, Anthony Torres, Angela Montoya. Not pictured: Abraham Padilla, Juanita Trevino, Angelica Sanchez, Dan Colman.



Above: Bridge to the Doctorate students and New Mexico staff join NMSU dignitaries at the International and Intercultural Education Fair and Forum in Chihuahua, Mexico in Oct., 2008

ogy Education, and Nader Vadiee, Engineering Programs Coordinator, along with Norton Martza and SIPI Alumni and former New Mexico AMP student Dylan Maho presented at the NSF ATE PI Conference in Washington, D.C. in Oct., 2008.

# *New Mexico AMP Students Leverage Participation in Other Excellent Programs*

**Danielle Miranda**, New Mexico State University (NMSU) student, was selected to participate in the prestigious 7th



Annual Intra-mural NIAID Research Opportunities (INRO) program in Feb., 2009 at the National Institutes of Health

(NIH) campus in Bethesda, Maryland. Danielle transferred from NMSU-Alamogordo and participated in the New Mexico AMP Summer Community College Opportunity for Research Experience (SCCORE) program and the Undergraduate Research Assistantship (URA) program at NMSU. Danielle completed two summer internships at the Fred Hutchinson Cancer Research Center. In the most recent internship in 2008, she worked with Dr. Denise Galloway, who developed the Gardisal vaccine that has been proclaimed as a new weapon on the war on cervical cancer.

**Steven Aragon**, undergraduate biology major and URA at Eastern New Mexico University (ENMU), works with Dr. Manuel Varela on salmonella research. The research is funded by the NIH IDEa Networks of Biomedical Research Excellence (INBRE) program. The objective of this study is to determine the antimicrobial agent susceptibil-

ity profile for *S. enterica* clinical isolates that were responsible for the recent New Mexico outbreak of salmonellosis. Such antimicrobial susceptibility data is necessary for ultimately circumventing resistance determinants and in establishing practices that prevent conditions that foster emergence of antimicrobial resistance mechanisms. The material and methods of the research includes isolation of clones, growth and maintenance of Salmonella cultures, biochemical characterization of Salmonella isolates, molecular analysis, and antimicrobial susceptibility analysis.

**Mark Seger**, transfer student from New Mexico Military Institute (NMMI) to NMSU, is a Ph.D. molecular biology major at NMSU who previously participated in the Alliance for Graduate Education and the Professoriate (AGEP) program. Currently, Mark participates in the NIH Minority Biomedical Research Support-Research Initiative for Scientific Enhancement (MBRS-RISE) Program, working with faculty advisor/mentor Dr. Champa Sengupta-Gopalan. The focus of his M.S. project while in AGEP involved genetically up regulating the activity of cytosolic glutamine synthetase (GS1). This project led Mark to his current study with sucrose-phosphate synthase (SPS), a key enzyme controlling the flux of carbon into

sucrose biosynthesis. The objective of this study is to determine how the constitutive increase of SPS, and thus sucrose supply, affects the SNF process and the interactions between the carbon and nitrogen metabolic pathways.

**Matthew G. Garcia** is a junior majoring in biology who has participated in the URA program at the University of New Mexico (UNM) for two years. Matt has been involved in research in the microbial diversity of lava tubes on the island of Hawai'i. To learn more about his research and to collect samples, Matt and his advisor, Dr. Diana Northup, traveled to Hawai'i in January, 2008. During



the sampling trip, they visited lava tubes of different

ages that are located in different volcanic flows and under different surface vegetation and precipitation regimes. Matt hopes that these different factors will shed some light on what controls diversity in the colorful microbial mats that coat the walls of many lava tubes worldwide. Matt will present his research at the 15th International Congress of Speleology in Keller, Texas in July, 2009. Matt plans to pursue graduate studies, possibly in the biomedical research area.

# Expanding Horizons

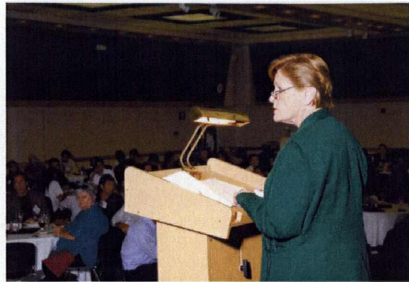
## 2008 Student Research Conference

*Continued from page 1*

At the luncheon, New Mexico Senator Mary Kay Papen shared her own personal journey as a returning student to NMSU. This experience helps her relate to many of the challenges that students face. Senator Papen recalled her childhood and how her mother “dragged” her along on her volunteer work, an experience that instilled in her a desire to serve others and to help them succeed. Retracing some of the history of educational oppression and how reform was made possible, the senator asked the students to remember the hard work that has made this change possible, reminding them that they are “reaping the benefits.” She also called for students to not take for granted this privilege and to “give back what they were given” by serving others.

Student research presentations took place throughout the day, with 16 oral presentations and 43 poster presentations. Twelve (12) oral presentations and 33 poster presentations competed for awards.

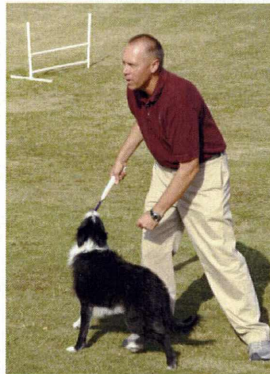
Students networked with NMSU faculty members during the University Research Council Poster Presentations and the NMSU Information Fair. Jesse McAvoy, Graduate Assistant for Dr. Ou Ma, Professor of Mechanical Engineering, informed students about his research on the autonomous helicopter that



*Above: Senator Mary Kay Papen calls for students to serve others and not take their for granted what others have done for them*



*Above: Students interact at the Conference Luncheon and prepare to hear Senator Papen*



*Above: Dr. Steve Stochaj demonstrates Search and Rescue with his dog Splash*

will serve as a base platform for researching visual-based flight controls. Then he demonstrated the unmanned aerial vehicle outside. Drs. Steve Stochaj and Nancy Chanover, both professors at NMSU, shared their research interests and their work with Mesilla Valley Search and



*Above: Dr. Jacob Urquidi gives the Keynote Address at the Conference*



*Above: Jesse McAvoy demonstrates the autonomous helicopter serving as a base platform for visual-based flight control*



*Above at left: Dr. Jacquez presents the First Place Award to Frederick Crawford for the Oral Presentation Competition and at right, he presents to poster division winners Danielle Miranda and Julie Fernandez DeGraaf, who tied for First Place*

Rescue and demonstrated with their dogs some of their skills. Community college students had the opportunity to learn how to navigate the conference, make the most of the experience, and become better informed about transfer at the pre- and post-conference workshops.

# New Mexico AMP Administrative Offices

**Director:**

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

**Co-Directors:**

*Dr. Rudi Schoenmackers*

*Dr. Delia Valles-Rosales*

**Program Manager:**

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**Public Info/Stu. Dev. Coordinator:**

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**Data Coordinator:**

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**Program Accounts Coordinator:**

*Gloria Vásquez*

**New Mexico Alliance for  
Minority Participation**

MSC-3AMP

New Mexico State University

P.O. Box 30001

Las Cruces, New Mexico

80003-8001

Telephone: (575) 646-1847

FAX: (575) 646-2960

email: amp@nmsu.edu

www.nmsu.edu/~nmamp

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**National Science Foundation**

**Louis Stokes Alliances for**

**Minority Participation**

4201 Wilson Boulevard

Arlington, VA 22230

**Director, NSF**

*Dr. Arden L. Bement*

**Assistant Director, Directorate for  
Education and Human Resources**

*Dr. Cora B. Marrett*

**Deputy Division Director,  
Division of Human Resource  
Development**

*Dr. Victor A. Santiago*

**LSAMP Program Director**

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# New Mexico AMP Institutions

## Universities

**Eastern New Mexico University (ENMU)**

Brian Pasko, Assistant Professor of Mathematics, (575) 562-2367

**New Mexico Highlands University**

Contact the administrative office at NMSU (505) 646-1847

**New Mexico Institute of Mining and Technology**

Allison Costello, Associate Director Admissions (505) 366-2560

**New Mexico State University (NMSU)**

Michele Auzenne, Program Manager (575) 646-1847

**University of New Mexico (UNM)**

Laura Crossey, Professor, Earth & Planetary Sciences (505) 277-5349

**Western New Mexico University**

Zenaido (Tres) Camacho, Asst. Prof. Biology (575) 538-6352

**Diné College**

Clarissa Bowman, RISE Coordinator Math, Science & Technology (505) 368-3555

## Community Colleges and Branch Campuses

**Central NM College**

Karla Melendez, Instructor, Math, Science, Engineering (505) 224-3535

**Luna Community College**

Andrew Feldman Math, Science & Technology (505) 454-5306

**New Mexico Junior College**

Pat Gorman, Dean of Counseling, (575) 492-2572

**New Mexico Military Institute**

Brig. Gen. Doug Murray (575) 624-8022

**NMSU-Alamogordo Community College**

Cathy Aguilar-Morgan, Chair, Department of Math (575) 439-3772

**NMSU-Doña Ana Community College**

Tarlochan Dhillon, Chair, Industrial Technology (575) 527-7586

**NMSU-Carlsbad Community College**

Robyn Hayes, Coordinator, Career Development Center (575) 234-9335

**NMSU-Grants Community College**

Marlene Chavez Toivanen, Math Instructor (505) 287-6652

**Northern New Mexico Community College**

Ajit Hira, Instructor (505) 747-5419

**San Juan College**

Contact the administrative office at NMSU (505) 646-1847

**Santa Fe Community College**

Phyllis Baca, Chair, Technologies (505) 490-1557

**Southwestern Indian Polytechnic Institute**

Nader Vadiie, Coor., Engineering Programs (505) 792-4618

**UNM-Los Alamos**

Cedric Page, Executive Director (505) 661-4689

**UNM-Valencia Campus**

Miriam Chavez, Chair, Science Department (505) 925-8613

**UNM-Gallup Campus**

Kamala Sharma, Asst. Professor, Chemistry (505) 863-7546

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