NMSU Honors Top Researchers Who Won in Excess of $500,000 in Sponsored Awards in FY 2012

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NMSU honored top researchers who garnered external funding in excess of $500 thousand to support research activities during the fiscal year 2012. In a ceremony held on November 28, Interim President Manuel Pacheco recognized the 59 top researchers for their contribution to research at NMSU. “We acknowledge and appreciate the hard work of all NMSU researchers who engage in research, as your research activities have positive impact on the State and the nation, and fundamental impact on NMSU’s education goals,” said Interim President Pacheco.

**COLLEGE OF AGRICULTURAL, CONSUMER, AND ENVIRONMENTAL SCIENCES**
Katherine Bachman
Jeff Bader
Jon Boren
Martha Desmond
Esther Devall
Willis Fedio
Alexander Fernald
Mary O’Connell
Tanner Schaub
Robert Silver
David Thompson
Carol Turner

**COLLEGE OF ARTS AND SCIENCES**
Jeffrey Arterburn
Reta Beebe
Gary Eiceman
Jon Holtzman
Michael Johnson
Karen Mabry
Enrico Pontelli
Elba Serrano
Jeremy Smith

**COLLEGE OF BUSINESS**
Cara Meghan Downes

Interim President Pacheco presenting the ‘millionaire’ plaque to Mary O’Connell, Distinguished Professor of Plant and Environmental Sciences and Helena (Lene) Lorest, the program coordinator for the U54 partnership grant.

**COLLEGE OF EDUCATION**
Nancy Baptiste
Susan Brown
Wanda Maria Bulger-Tamez
Elizabeth Cahill
Kathleen Cronin

**COLLEGE OF ENGINEERING**
Sang Yeon Cho
Jeanine Cook
Russell Hardy
The U.S. Department of Homeland Security (DHS) is offering faculty and students at Minority Serving Institutions an opportunity to participate in a ten-week summer research team experience at university-based DHS Centers of Excellence as part of its DHS Summer Research Team Program for Minority Serving Institutions.

At the end of the summer, faculty participants are encouraged to apply for up to $50,000 in follow-on funding. The faculty application deadline is January 7, 2013. Details about the program, including eligibility guidelines and application forms, can be found at http://www.orau.gov/dhseducation/faculty

For more information, contact Patti Obenour, Project Manager at (865) 574-1447 dhsed@orau.org or patti.obenour@orau.org
NMSU’s 12th Annual URC Research and Creativity Activities Fair

By Hamid M. Rad, ORD

NMSU’s 2012 University Research Council (URC) Fair was held on October 5 in conjunction with the New Mexico Alliance for Minority Participation (New Mexico AMP)’s annual statewide student research conference. The URC fair showcased 38 outstanding research projects in various areas including agriculture, alternative energy, astronomy, biology, border issues, health, and water. After reviewing the project posters and evaluating them for scientific merit, content, organization and the presenters, the URC fair judges (Kathleen Huttlinger and Wanda Borges, School of Nursing; Susan Beck, NMSU Library; and Pierre Orelus, College of Education) selected the six posters below as the winners of this year’s fair.

First place - “The HYPER Project: Harvesting Hydropower from Low-head Waterways,” Dr. Nadipuram Prasad

Second place - “Examination of Race Structure for Verticillium dahlia Isolates Affecting Chile Pepper Production in New Mexico,” Dr. Stephen Hanson.

Third place (Four posters tied) - “Geometric Spreading,” Nishath Ranasinghe, Andrea Gallegos, Dr. Thomas Hearn; “How do the Physicochemical Properties of Nanoparticles Influence their Biological Behavior?” Eshan Dahal; “Mother-Infant Interactional Patterns Predict Infant Learning,” Gin Morgan, Ashley O’Hearn, Dr. Laura Thompson; “Network Analysis of Brain Imaging Data,” Angela Muhanga.

ADDITIONAL POSTERS AND PARTICIPANTS


2. “What do we do with 1,000,000 Gb of Images of the Sun?” James McAteer

3. “Apache Point Observatory: Solving the Universe’s Mysteries Since 1991” Alaina Bradley and Gretchen Van Deren

4. “Lg Attenuation in the Central United States Revealed by the EarthScope Transportable Array,” Andrea Gallegos, Andrea Trujillo, Rajiv Ranasinghe, James Ni, Eric Sandvol

5. “Transesterification of Camelina Palm and Waste Cooking Oil” Tapaswy Muppaneni

6. Long Term Eddy Covariance Corrections Over Elephant Butte Reservoir Jimmy Moreno, A. Salim Bawazir

7. Screening for Biocontrol Agents for Protection of Chile Peppers Against Phytophthora capsici Steve Hanson
8. “An Improved Method for DNA Sequence-Based Identification of Nematodes,” Steve Hanson


11. “Effect of Corn Oil or Corn Protein Supplementation on Performance and Rumen Fermentation Characteristics of Feedlot Lambs Consuming a 90% Concentrate Diet,” Christopher Shelly


14 “New Mexico State University- Fred Hutchinson Cancer Research Center Partnership,” Helena Loest


18. “Determining Protein Localization by Fluorescence Lifetime Flow Cytometry,” Kevin Houston, Ali Vaziri Gohar, Ruofan Cao, Wenyan Li, Patrick Jenkins, Jessica P. Houston

19. “Event-Related Spectral Perturbations Demonstrate the Impact of Different Styles of Diabetes-Related Medical Literature: A Neuro marketing Study,” James Kroger, James D. Schaffer, Cuouemoc Luna Nevarez, and Elise
Sautter

20. “Mother-Infant Interactional Patterns Predict Infant Learning,” Gin Morgan, Ashley E. O. Hearn, Laura A Thompson


23. “Porous Sn02 Helical Nanotubes and Sheets for Lithium Ion Batteries,” Hongmei Luo


25. “Border Realities and Hispanic Communities Border Realities in Immigrant Communities,” Maria Gurrola

26. “Evaluating the Social Impact of a Milling Station in Rural Tanzania,” Terri Horn

27. “An Innovative Approach for Using Concentrate

Stream of Desalination Units,” Saed Aghahossein Shirazi, Jalal Rastegory, Abbas Ghassemi, and Tracey Fernandez


29 “Scaling Up Mathematics Achievement,” Cathy Kinzer

30. “Opportunities for Learning Mathematics,” Sara Morales


32. “Managed Riparian Zones to Conserve and Improve Water Quality and Improve Habitat,” Juan Solis

33. “Using Artificial Neural Network to Investigate Evaporation Losses at Caballo Reservoir,” Dung Tran, A. Salim Bawazir

34. “Stability and Estimation in Stochastic De-
Third place winner, "Mother-Infant Interac-
tional Patterns Predict Infant Learning," Gin Morgan, Ashley O'Hearn, Dr. Laura Thomp-
son (Psychology)

Third place winner, "Network Analysis of
Brain Imaging Data," Angela Muhanga

2012 NMSU Research
Rallies

By Hamid Mansouri Rad, ORD

The Office of Vice President for Research organizes research rallies to publicize the work of our researchers for their high impact research projects. We invite the community, city, and State officials to support and acknowledge the value of the research activities being conducted at NMSU.

The researchers below were recognized in 2012.

Richard Hareema, Cooperative Extension Ser-
vice specialist and Jay Lillywhite, Agricultural
Economics and Agricultural Business for their
$2.4 million grant to market nutritional benefits
of pecans. (http://newscenter.nmsu.edu/9046/
nmsu-celebrates-2.4-million-grant-market-
nutritional-benefits-pecans)

Ou Ma, Mechanical Engineering, for his U.S.
patent on the reduced-gravity technology he has
developed (http://newscenter.nmsu.edu/news/
article/8896/)

Michael Johnson, Chemistry and Biochemistry,
for $3.8 million grant renewal of Minority Ac-
cess to Research Careers (http://
newscenter.nmsu.edu/news/article/8977/)

Karen Mabry, Biology, for her $910,000 NSF
CAREER Award to study the dispersal of brush
mice through a social landscape (http://
newscenter.nmsu.edu/news/article/8558/)

Jessica Houston, Chemical Engineering, for her
$500,000 NSF CAREER Award to study the
measurement of a cell (http://
newscenter.nmsu.edu/news/article/8558/)

Satyajayant Misra, Computer Science;
Graciela Unguez, Biology; and Hong Huang,
Klipsch School of Electrical and Computer Engi-
neering. for their $800,000 NSF INSPIRE grant
to research inexpensive, customizable, and easily
programmable wireless sensors (http://
newscenter.nmsu.edu/news/article/8827/)

Danny Ball, Physical Science Laboratory, for
$12.5 million NASA award to help develop su-
personic inflatable decelerators for Mars landings
(http://newscenter.nmsu.edu/news/article/8509/)
Healthy relationships are key to making any organization run smoothly, whether it is a university, a classroom, or a family. Since 2007, almost 2,000 Doña Ana families have devoted significant effort and time to improving and strengthening their relationships with the help of the New Mexico Border Communities Healthy Marriage and Relationships Project. Directed by Esther Devall, Professor and Department Head of NMSU’s Family and Consumer Sciences, the Project was recently granted another $800,000 by the Administration for Children and Families (ACF) to continue providing an expanded version of this program for another three years. “We help participants develop skills to better navigate relationships—sometimes even the skills to know when they’re in a bad relationship,” says Devall.

Although marriage is part of the Project’s focus, the only criterion for participation is having a child. Single parents, grandparents, married or unmarried couples—all can find healthier ways to solve problems and create stable home environments allowing children to be children and fostering their spirit and development. Devall says that in some families, children end up parenting struggling parents, so sometimes family members need to rethink and redefine their roles. Parents learn how to do this as well as how to discipline productively, budget economically, and model positive behaviors such as leading, listening, and cooperating through the Project’s Family Wellness curriculum. They are also screened for domestic violence issues and learn that problems are sometimes not simply a matter of physical abuse, but also financial, mental, and emotional abuse. Ultimately, families learn and practice ways to strengthen their relationships and forge a sense of commitment and unity.

This means that children must engage as well. For the first half of the 12-week program, kids participate alongside their parents; during the last half, children participate in their own related programming while parents continue delving into their other relationships. Devall notes that initially, she and her team thought it made sense to address adult interpersonal relationships during the first part of the program—after all, that is where families begin. But they
soon recognized that often those adult relationships are missing a sense of trust and collaboration, which is more easily built through focus on helping their children. Once they’ve made advancements on that front, parents are more capable of productively focusing on their marriage or other adult relationships and issues.

Because the whole family devotes two-and-a-half hours each week for 12 weeks to this work, Devall aims to make participation as easy and convenient as possible. So the Project usually goes on the road, bringing *Family Wellness* instructors, staff, and food to churches, community centers, and schools hosting the classes throughout the county. Staff also mail weekly postcards to participants thanking them for coming, notifying them of upcoming topics, and letting them know they were missed if absent previously. This extra effort has resulted in the Project retaining and serving more than its projected 270 parents each year for a total of over 1,900.

The Project’s success is also attributed to a rigorous evaluation process, which was developed by Marcel Montañez, Associate Professor of Family and Consumer Sciences. One year into the initial five-year grant period, *Family Wellness* associates, makers of the *Family Wellness* curriculum, contracted Montañez to develop the *Family Wellness* Evaluation Instrument, which measures ten constructs closely aligned with the curriculum. It is now used across the country to gauge the effectiveness of *Family Wellness* programs and has indicated that the New Mexico Border Communities Healthy Marriage and Relationships Project is consistently and significantly successful in helping families improve overall.

The ACF recognized this achievement and recently funded the Project for another three years. During this phase, additional career advancement and case management services are being offered. Participants have always been assessed for resource needs and then connected appropriately, but now using a work readiness and career advancement assessment tool, Project staff also help parents identify their strengths and needs related to employment and then connect them with appropriate resources.

What’s next? Devall believes her program can be successfully applied to a variety of populations and issues including military families and those struggling with obesity (since family dynamics are often expressed through food habits). She intends to explore other sources of funding to further develop the program in needed directions.

Esther Devall is one of the “top researchers” honored by Interim President Pacheco for her contributions to research at NMSU. For additional information about this project please contact her at edevall@nmsu.edu.
The research initiated by a NMSU Regents Professor of History on the 16th and 17th century books of secrets has now grown and been pursued by many other historians. When William Eamon published his first book, *Science and the Secrets of Nature*, in 1994, hardly anyone had ever examined these texts. “No one really knew what to do with them, since they were mainly composed of recipes relating to alchemical, technological, and experimental subjects” says Eamon. But since his book was published, hundreds of articles, books, and dissertations have been written about them, and countless conference sessions devoted to the study of them. In other words, *Science and the Secrets of Nature* created a new sub-field in the history of science.

In 2008, Eamon was recognized for his contribution to scholarship in a 2-day conference at Trinity College, Cambridge dedicated to books of secrets in the Renaissance. Eamon gave the keynote address at the conference and wrote the lead essay in the resulting book, *Secrets and Knowledge in Medicine and Science, 1500–1800* edited by Elaine Leong and Alisha Rankin. ISBN-13: 9780754668541

William Eamon is the Dean of NMSU’s Honors College and Regents Professor History. He teaches courses on the history of science and medicine and his latest book *The Professor of Secrets: Mystery, Magic, and Alchemy in Renaissance Italy* was on the 16th century Italian physician Leonardo Fioravanti.

For more information contact William Eamon at weamon@nmsu.edu.
MSU Computer Science Professor Joe Song and his students, Yang Zhang, Zhengyu Ouyang and Haizhou Wang, published a paper in the Journal of Nature Methods, a high impact, prestigious scientific and medical journal.


Abstract:

Reconstructing gene regulatory networks from high-throughput data is a long-standing challenge. Through the Dialogue on Reverse Engineering Assessment and Methods (DREAM) project, the authors performed a comprehensive blind assessment of over 30 network inference methods on *Escherichia coli*, *Staphylococcus aureus*, *Saccharomyces cerevisiae* and in *silico* microarray data. They characterize the performance, data requirements and inherent biases of different inference approaches, and provide guidelines for algorithm application and development. They observed that no single inference method performs optimally across all data sets. In contrast, integration of predictions from multiple inference methods shows robust and high performance across diverse data sets. They thereby constructed high-confidence networks for *E. coli* and *S. aureus*, each comprising ~1,700 transcriptional interactions at a precision of ~50%. They experimentally tested 53 previously unobserved regulatory interactions in *E. coli*, of which 23 (43%) were supported. Their results establish community-based methods as a powerful and robust tool for the inference of transcriptional gene regulatory networks.

The goal of the DREAM project is to catalyze the interaction between experiment and theory in the area of cellular network inference and quantitative model building in systems biology.

For additional information about this project contact Joe Song at joemsong@nmsu.edu.