

# NMSU RESEARCH NEWS

Newsletter of the Office of Vice President for Research, Graduate Studies, and International Programs

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APRIL 2008



Photo by Hamid Mansouri Rad/OVPR



## Michele Nishiguchi, Biosciences Cluster Leader

Michele Nishiguchi is a marine biologist at NMSU's college of Arts and Sciences. She joined NMSU in 1999. Prior to that, she was a Postdoctoral research associate in the Geology Department at the University of California, Los Angeles. Recently Michele was appointed the leader of NMSU's Biosciences cluster. We met her at her lab where she and PhD student Daniel Zamborsky keep their squids in an environment resembling the bottom of the ocean (and that means cold!).

**Question: Who is Michele Nishiguchi? How did you become interested in becoming a marine biologist?**

I hate to say this, but as a kid, I used to love watching all those Jacques Cousteau specials on TV, and I have always had this great love and respect for the world's oceans. Growing up near Monterey in Central California was a perfect place to be absorbed by the sea, and I think having been around the sea had a definite impact on what I wanted to study in school (zee whales, we have to save zee whales.....)

**Q: You do a lot of field research**

*Continued on page 4*

Submit your research-related news or announcements online at: <http://research.nmsu.edu/news>

# IEE's 2008 Environmental Design Contest

Photo by Hamid Mansouri Rad/OVPR



**The University of New Hampshire team, co-winners of the Task 1 competition, present their design solution for Task 1, Innovative Technologies for and Existing Commercial Building. Front Row: Cara Hayward (Business), Tyler Crowe (CIE), Jesse Medeiros (Business), Amy Conaty (CIE), Jeff Senders (ENE), Owen Friend-Gray (ENE), Back Row: Zachary Magdol (ENE), Justin Butterfield (ENE), Scott Cloutier (ENE), Greg Sereni (ENE), Philip Trzcinski (Business) Not Pictured: Patrick Hartnett (Business), John Heaney (CIE), Hillary Schmidle (ENE)**

College of Engineering's Institute for Energy and the Environment (IEE) and the Consortium for Environmental Education hosted their 18th Environmental Design Contest on April 6 - 9 at the Pan Am Center. This year's contest featured the final project showcase of the National Science Foundation New Mexico Chihuahua Partnership for Innovation, a bi-national project involving partners from higher education, governmental laboratories, state and local government agencies, and private sector organizations on both sides of the U.S.-Mexico border.

There were 33 teams, including three international teams, participated in this year's competition and presented their projects in one of the following tasks:

### Task 1. Innovative Technologies for an Existing Commercial Building

The teams were supposed to re-

search, prioritize, develop and then demonstrate innovative technologies that can be applied to existing commercial buildings to improve efficiency and reduce its environmental footprint.

The teams' solutions in this category were evaluated based on the following criteria:

- Understanding of present industry practices;
- Practicality of proposed methods;
- Magnitude of proposed cost reduction;
- Justification of cost reduction predictions;
- System reliability and redundancy;
- Novelty of proposed methods;
- Originality in bench-scale demonstration; and
- Use of mobile technology.

### Task 2. Photovoltaic System (PV) Performance Indicator

## Winners!

### Task 1:

- 1st place - tie
- Roger Williams University \$1,250
- University of New Hampshire \$1250

Best Paper and innovation of technology and ecologically friendly design - Univ. of Waterloo \$500

### Task 2 and 4:

- 1st place - Oregon State \$2500
- Outstanding Bench Craftsmanship - Univ. of Rhode Island \$500

### Task 3:

- 1st place - Universidad de las Americas \$2500
- 2nd place - Univ. of Arkansas \$1,000
- Notable Presentation for both Oral and Bench Scale - Clarkson \$500

### Task 5:

- 1st place - Univ. of Arkansas \$2500
- 2nd place - Univ. of Idaho \$1000

### Judges Faculty Award:

- Mark Bricka, Mississippi State \$1,000
- Mike Berger Outstanding Faculty Award: David Drown \$1250

### Life Long Achievement Award:

- Goran Jovanovic - Oregon State \$1250

### Terry McManus Memorial Award (tie):

- Joyann Pafumi - Roger Williams Univ. (\$750)
- Scott Cloutier - Univ. of New Hampshire (\$750)

### ORAU Award: Closest to implementation process (patentable)

- Univ. of Arkansas Task 3 -\$2500
- EPA Science Forum Travel Award - \$1,000 each team
- Roger Williams Univ. - Task 1
- Univ. of New Hampshire - Task 1
- Univ. of Waterloo - Task 3
- Montana Tech - Task 3
- Intel Award for Innovation
- Roger Williams University Task 1 \$2500

### NSF Recipients

- 1st Oral presentation: New Mexico Tech
- 1st Poster presentation: New Mexico State University



## PARTICIPANTS

## SCHOOLS

Bogazici University  
 California Polytechnic State Univ.  
 Clarkson Univ.  
 Duke Univ.  
 Mississippi State University  
 Montana Tech  
 New Mexico State University  
 Ohio University  
 Oregon State University  
 Roger Williams University  
 S.D. School of Mines & Tech.  
 Tennessee Technological Univ.  
 University de las Americas  
 University of Arkansas  
 University of California Riverside  
 University of Evansville  
 University of Idaho  
 University of Manitoba  
 University of New Hampshire  
 University of Rhode Island  
 University of Waterloo  
 Washington Univ. in St. Louis  
 Youngstown State University

NSF NEW MEXICO-CHIHUAHUA  
PARTNERSHIP FOR INNOVATION

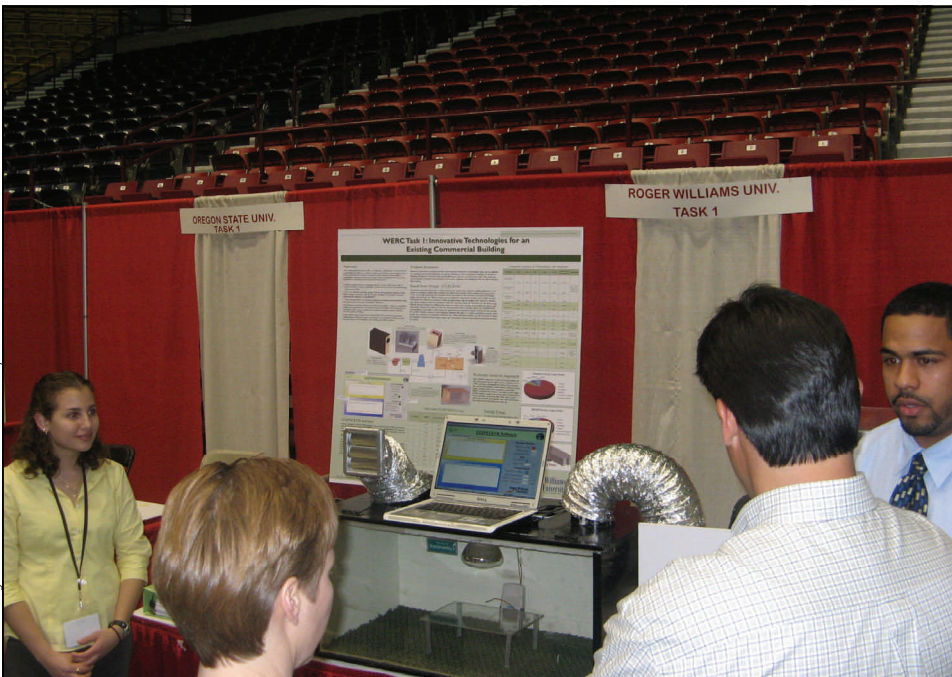
Instituto Tecnologico De Estudios  
 Superiores De Monterrey  
 Centro de Investigacion En Maeriales  
 Avanzados  
 Univesidad Autonoma De Ciudad  
 Juarez  
 New Mexico Institute of Mining and  
 Technology  
 New Mexico State University

Task 5. Separation of Water from  
Emulsified Oil

In this category the teams were asked to develop a new cost efficient process to increase the recovery of water and oil from an emulsion consisting of 2% oil and 98% water. The teams' projects were evaluated based on their:

- Minimal upkeep and consistency of process;
- Justification of cost and energy efficiency;
- Originality of proposed methods and
- Yield and soundness.

For more information about the contest visit: <http://iee.nmsu.edu> or contact Dr. Abbas Ghassemi via email at [aghassem@nmsu.edu](mailto:aghassem@nmsu.edu) or (575) 646-2038.



The Roger Williams University team, co-winners of the Task 1 prize, demonstrating their solution.

This task involved developing a system to determine that a residential utility-interactive photovoltaic system is operating properly and that the ac power output is following the solar power available to the PV array. The evaluation criteria for this task were:

- Simplicity of display/ease of understanding;
- Effectiveness in dealing with varying PV system designs;
- Cost and reliability;
- Ease of installation—minimal attachments to the PV/electrical system;
- Minimal maintenance and continuous operability, and
- Lack of interference with other household devices.

## Task 3. Inland Desalination Operation and Disposal in Rural Isolated Communities

This task required the participants to develop and demonstrate a low-cost, energy efficient, simple and reliable system for use in brackish water reclamation. The teams' solutions were evaluated based on the following criteria:

- Ease of use;
- Affordability;
- Yield and viability;

- Reliability;
- Energy and water use efficiency;
- Cost effective operation;
- Disposal cost and handling;
- Long term performance and system management;
- Cost and quality of the water produced per liter;
- Functionality and operability throughout the year, and
- Concentrate, reject water management and waste generation

## Task 4. Sampling Strategy for Spinach

This task involved developing a strategy to detect *Enterohemorrhagic coli O157: H7* (E-Coli) in spinach. The evaluation criteria for this task were as follows:

- Ease of implementation;
- Ease of use/maintainability;
- Ability to rapidly and effectively detect contamination;
- Reliability;
- Energy and water use efficiency;
- Cost effectiveness;
- Innovative design, and
- Consideration of waste products and disposal issues.

*"Michele Nishiguchi" continued from page 1*

for which you need to travel (a lot of us envy you for that, by the way). Your last adventure in Australia wasn't exactly glamorous. Tell us about it.

Well, normally you plan your field work a few months in advance (permits, collaborators, boats, diving, etc...). Last June I was scheduled to go down and collect *Euprymna*, but there was a cyclone sitting right over New South Wales. Since squids are nocturnal, you have to collect them at night. So here I was, in the dark, pouring rain, probably 55°F outside, and trying to seine net for *Euprymna*. My collaborator and I were pretty much hypothermic by the time we finished, and unfortunately, did not catch any (the water was too brackish, and the squids had gone out further to sea to escape that).

**Q: Why squid? What about that creature is so special to you, and what does it tell you about the ocean? What about other marine creatures?**

I'm interested in understanding symbiosis....that is, the relationship between two or more organisms. There are many marine organisms that have intimate relationships with other creatures, but I'm particularly interested in those that form with bacteria. There is a certain amount of "crosstalk" that is necessary in order for the symbiosis to work. Oftentimes, that communication between partners is not so "beneficial" either. I like to make analogies between symbiotic relationships and marriage...there is the courtship (trying to find your host, and competing against other potential symbionts), then the marriage and honeymoon (infection and colonization, where, if it's a mutualistic symbiosis, then each partner benefits from the other in a certain capacity), and sometimes, when it doesn't work out, divorce (pathogenic associations fit into this category, although one partner definitely benefits more than the other. Hhhmmmm. Sound familiar?

**Q: What are your goals for the Biosciences cluster? When we talk to you this time next year, what do you hope the cluster will have achieved?**

I think the main focus for this year is to ensure the success and renewal of our large research and training grants (MBRS-MARC, RISE, HHMI, INBRE, etc...). It is really fantastic that NMSU has so many talented scientists here who have worked extremely hard to get these types of grants funded and are ensuring the success of those programs and the students who are in those programs. The next task is to make sure that we maintain those grants through our renewals as well as receive internal support from the university. I hope I can garner that support, as well as seek other avenues of funding that would complement the strengths of the scientists at this university.

**Q: The Office of Strategic Initiatives is behind you 100 percent. What do you expect us to do for you and the cluster?**

I would hope to receive more resources for our scientists who are involved in these types of large research grants. One of the issues that I hear constantly from my colleagues here is the loss of momentum/support once these programs are funded, which eventually leaves the researcher(s) standing on their own. I also do not feel its just monetary support, but the need to improve how we (scientists) can easily manage our grants. I know this is one frustration that I personally have with my own research program.

*Continued on page 5*

Photo by Hamid Mansouri Rad/OVPR



**Michele Nishiguchi and students Jenna Painter and Clayton Gorman at the Marine Symbiosis lab, setting up DNA restriction enzyme digests to analyze multiple strains of *Vibrio harveyi*, a symbiont found in Liliigid from Australia.**

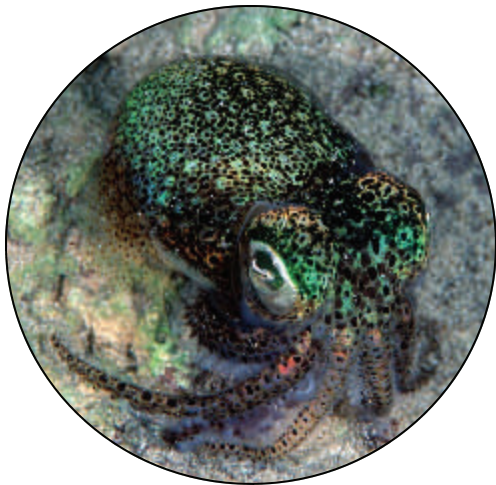


Photo by Mark Norman

***Euprymna Tasmanica*, sepiolid squid from Australia**



*"Michele Nishiguchi" continued from page 4*

**Q: What would you like to say to other NMSU faculty and researchers?**

Please contact me for any suggestions, ideas, or comments regarding research in the Biosciences.

**Q: What's next for "Nish," as your students affectionately call you?**

Summer will be teaching Evolution, research with my students, and field work back in Banyuls-sur-Mer, France. But first, I have to compete in a 1/2 iron man at the end of May. I haven't raced since I was in graduate school, so it will be pretty interesting to see how this one goes. At least I'm in a slower age group now!

Michele Nishiguchi earned a B.S. in Biochemistry, minor in Theatre Arts, University of California, Davis and a M.S. in Marine Biology at University of California, San Diego, Scripps Inst. of Oceanography. She received her PhD in Biology with emphasis in Biogeochemistry, University of California, Santa Cruz NSF postdoctoral research associate in Marine Biotechnology, University of Southern California and University of Hawaii.

**Left: Michele Nishiguchi diving in Australian waters**

Photo by Julie Summerling



## College of Agriculture Assistant Professor Finalist for AAAS Science and Fellowship for 2008-2009 in D.C.

Dr. Rene Hadjigeorgalis has been selected as a finalist for an American Association for the Advancement of Science (AAAS) Science and Technology Policy Fellowship for 2008-2009 in Washington D.C. Her placement will be with the Department of State, U.S. Agency for International Development, USDA Foreign Agricultural Service or National Institutes of Health Fogarty International Center. The AAAS Science and Technology Policy Fellowship helps to establish and nurture critical links between federal decision-makers and scientific professionals to support public policy that benefits the well being of the nation and the planet. The fellowships are designed to provide scientific expertise and analysis to support decision-makers confronting increasingly complex scientific and technical issues. The AAAS Science and Technology Policy Fellowships are highly competitive. Dr. Hadjigeorgalis was one of 95 fellows selected from among nearly 400 qualified Ph.D. and Masters of Engineering applicants nationwide.

Dr. Hadjigeorgalis is a faculty member in the College of Agriculture and Home Economics. She joined NMSU in 2003 after three years at the Pontificia Universidad Catolica de Chile and the Universidad de Talca. Dr. Hadjigeorgalis received her Ph.D. in Agricultural and Resource Economics from the University of California, Davis in 1999 and was a Fulbright Scholar to Chile in 1998-99. She is currently the principal investigator for a multi-year project on market-based approaches to water conservation in the Rio Grande and teaches courses in International Agricultural Trade Policy and World Agriculture and Food Problems.



**Rene Hadjigeorgalis, Assistant Professor at NMSU's Department of Agricultural Economics and Agricultural Business**

# PSL'S MATRIX PROJECT: PREPARING STUDENTS FOR WORKFORCE OF THE FUTURE



NMSU's Physical Science Laboratory (PSL) has recently embarked on a new project, entitled the MATRIX, to conduct research on how achievement in middle school mathematics can be enhanced through after-school activities that take advantage of digital media.

The MATRIX, which stands for, "Middle school Achievement through Technology-Rich Interventions," is in partnership with the Ohio Board of Regents and K-16 partnerships in Kansas, California, and Ohio and is funded by the U.S. Department of Education as one of its "Star Schools" projects. The MATRIX, targeting students in middle school, is designed for those schools, in both urban and rural areas, that are not meeting their Annual Yearly Progress (AYP) goals. But how does one improve math education and learning by examining digital media and video games?

There is a growing recognition that the world of the 21<sup>st</sup> Century student and learner is a very different one from the world experienced by students and learners in the past. That difference manifests itself in many ways. Consider for a moment what students find interesting and meaningful in their everyday activities, and the technologies that they use while spending time outside of the classroom. The Matrix website points out that "mobile technologies that fit in their pocket or book bag, endless resources on the Internet, and real-life examples and experiences provided by the media and their friends serve as up-to-the-minute resources that fill their free time. Researchers and observant teachers are beginning to ask how the learning opportunities offered by mobile technologies and electronic games might be used to support children's formal learning—heightening their interest in learning at school and thereby increasing the amount of time they spend in formal learning that leads to success in school and adult life" (<http://www.matrixlearning.org>).

For the MATRIX research project, PSL is focused on discovering how informal learning in emerging mobile technologies, simulations, and digital media can be leveraged to help the formal educational environment in today's schools. But how will that research have a meaningful impact on learning, and support youth as they strive to be successful in an academic environment? Understanding how the learning opportunities offered by the new digital media engage and interest today's youth is vital for ensuring that the workforce of the future, and some say the future of the U.S., keeps pace with the ever-changing, multi-tasking, problem-solving, increasingly collaborative world of work.

PSL will be hosting a series of community-based research activities this summer for over 90 students. Along with the activities that will take place in community-based locations, the students will be given an opportunity to visit the NMSU campus. Researchers will be examining how digital media is used by youth in out-of-class, or informal, learning settings by providing IPODS, computer-based video games, and Internet resources during these activities. They will also be providing youth with the opportunity to document their own learning through the use of digital video. But perhaps most importantly for the middle school students, they will be allowed to play – and in doing so – provide the teachers and researchers of today with insights into how to educate the students of the future.

For additional information about this project contact Dr. Eneida Vazquez at [evazquez@nmsu.edu](mailto:evazquez@nmsu.edu)



# 2008 PSL Employee Service Awards

**O**n April 4, 2008 VP for Research Vimal Chaitanya and Associate VP for Research and Associate VP for Research and Director of NMSU's Physical Science Laboratory (PSL), Jay Jordan, honored the services of 42 PSL employees who worked at PSL from 5 to 40 years. The event was held at PSL's auditorium, where a large number of employees (including project managers Terry Anderson, John Garrett, Ray Bernstein, Robert Dickenshied, Phil Copeland, and John Allen Baker) were present.

In a short speech, Dr. Chaitanya, acknowledged the importance of PSL efforts and its contributions to New Mexico State University.

PSL was established in 1946 and is nationally known for its research and development efforts, especially in the areas of Unmanned Aerial Vehicles (UAV) and Ultra-Long-Duration-Ballooning.

For additional information visit:  
<http://psl.nmsu.edu>

NMSU Research News is a bimonthly newsletter published by the Office of the Vice President for Research, Graduate Studies, and International Programs. Comments are always appreciated. Please submit your research-related news or announcements online at:

<http://research.nmsu.edu/news>

For additional information about this newsletter contact Hamid M. Rad at (575) 646-6429 or via email at [hamid@nmsu.edu](mailto:hamid@nmsu.edu)



From left: Vimal Chaitanya, Jay Jordan, Scott Cannon and Phil Copeland

The honored employees were:

#### 40 Years of Service

Thomas Duval

#### 30 Years of Service

Ernest Archuleta  
John Allan Baker  
Rodrigo Cabral  
Richard Okrasinski

#### 25 Years of Service

Roger Collins (Retired)  
John Cruncleton  
Laurence Madewell  
Richard Stephens

#### 20 Years of Service

Danny Ball (CSBF)  
Carolyn Booker (CSBF)  
Mark Cobble (CSBF)  
Mitchell Coleman (CSBF)  
Joyce Dancer (CSBF)  
Victor Davison (CSBF)  
James Depue (CSBF)  
Gerald Gregg (CSBF)  
Scott Hadley (CSBF)  
Shirley Howarton (CSBF)  
Erich Klein (CSBF)  
Steven LaMotte  
Gary Marchant (CSBF)  
Sam Mares (Retired)  
MaryEllen Moseley (CSBF)

Barbara Myers

Keith Parkes (CSBF)

Thomas Paul

Michael Paz

Robert Perrin (CSBF)

Judy Reynolds (CSBF)

John Rosier (CSBF)

James Rotter (CSBF)

Mary Kathleen Smith (CSBF)

#### 15 Years of Service

Gregory "Scott" Cannon

Ruben Galvan

Stephen Lowe

Donald Roberts (CSBF)

#### 10 Years of Service

William "Tom" Laney

Angela Merritt

Michielle Read

#### 5 Years of Service

Paul Brasfield (CSBF)

Kevin Climp

Robert Endlich

Michelle Johnson (CSBF)

Charles Lackey

Ariel Mirles

Daniel Molina

OFFICE OF THE VICE PRESIDENT FOR RESEARCH, GRADUATE STUDIES,  
AND INTERNATIONAL PROGRAMS

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