



Graduate School and Office for the Advancement of Research and Scholarship  
102 Roudebush Hall, Oxford, OH 45056 <http://www.muohio.edu/oars>  
phone: 513-529-3600 fax: 513-529-3762

## Message from Dr. Bruce Cochran, Dean of the Graduate School and Associate Provost for Research



Welcome to this edition of the OARS newsletter. In it, you will find profiles of some of our outstanding faculty researchers, as well as additional information that you should find helpful.

The big event of the spring was, of course, the 15th annual Undergraduate Research forum, held on April 15. Nearly 200 student posters were presented, an increase of 30 percent over last year. We are grateful to President Hodge for hosting the luncheon, and I personally want to thank all members of the OARS staff and the Undergraduate Research Committee for all of the hard work they put into making the forum such a huge success.

Associated with the forum were two other research-related events. The first was the awarding of the Miami University Interdisciplinary Technology Development Challenge Program Award. This year's theme was "Recovered Energy Systems." As always, submitted projects work the collaborative efforts of students from the sciences, business, design, and the social sciences. Three teams competed; the winning project was entitled "Miami Green Diesel." Among this team's accomplishments was the identification of a new algal strain that is adapted to growth in

Ohio's climate and has potential as a source of biodiesel fuel.

The second event was the annual meeting of the Miami University Research Advisory Council. This group of representatives from area business enterprises meets annually to review applications for the Shoupp Awards (described inside this newsletter). This year, we also had a wide-ranging discussion about how Miami can work with various entities in the region and state to foster innovative research and economic development.

Back in the office, the OARS staff continues to work diligently to facilitate the grant-getting process for our faculty. Our awards this year are roughly on pace with those we received last year, so that even in these difficult economic times, our faculty members are enjoying success in the funding arena. Given the state of flux that state and federal budgets are in, identifying and obtaining the funding necessary to support cutting-edge research is uniquely challenging. Nevertheless, we stand ready to help, and I am confident that, given the energetic and talented faculty we have, we will succeed.

So thank you again for your contributions to another successful year of research at Miami, and you have my best wishes for success in the future.

# OARS Research News

---

## Dr. Carla Pestana (History) - Awarded a Guggenheim Fellowship



**Dr. Carla Gardina Pestana**, W. E. Smith Professor, has been awarded a Guggenheim Fellowship for her research on mid-seventeenth-century Atlantic conflicts among competing European powers. Pestana will explore the sharp rise in the contest for colonial dominance in the Atlantic world that occurred

in the 1650s and 1660s. Various European powers vying for position engaged in hostilities to snatch colonies from one another, and these local conflicts sparked wider wars for the first time. Studying this moment of increased antagonism from a social and cultural perspective, Pestana asks how the various participants justified their aggression and how they treated the colonists and others they conquered in these engagements. She hopes to work on two projects related to this historical turning point during her fellowship year. The first will be a broad study using a comparative and transnational framework to make the case that this was indeed a major shift; in that she will present these conflicts in the wider Atlantic world in terms of the emerging imperial agendas of various Western European states. Another, more focused undertaking will result in a book on the English conquest of Spanish Jamaica in 1655, which was a foremost example of the turn toward imperialism. After teaching almost 400 undergraduates in the fall of 2009, Pestana will take time off from her formal teaching duties to concentrate on these two projects.

Guggenheim Fellowships have been bestowed by The John Simon Guggenheim Memorial Foundation since 1925. In a “rigorous selection process,” the foundation receives some 3,500 to 4,000 applications each year, granting approximately 220 Fellowships. According to the foundation, Guggenheim Fellows are “men and women who have already demonstrated exceptional capacity for productive scholarship or exceptional creative ability in the arts.” In a recent publication marking the 75th anniversary of the award, Joseph A. Rice, Chairman of the Board of Trustees, declared that “the award of a Guggenheim Fellowship is a lifelong honor and source

of distinction for each recipient, but it does not mark the end or even the slowing down of a productive life. So the combination of continuing recognition of those qualifying for Fellowships and the continuing achievement of those who have already been honored comprises an extraordinary stimulation for the cultural and intellectual well-being of our society.”

The competition is open to scholars and artists in a wide variety of fields. At its meeting on Tuesday, April 7, the Board of Trustees approved the fellows for the current year.

A member of the Miami history faculty since 2003, Pestana serves as W. E. Smith Professor of History. Her previous books include *Quakers and Baptists in Colonial Massachusetts* (1991), *The English Atlantic in an Age of Revolution, 1640-1661* (2004), and the just-published *Protestant Empire: Religion and the Making of the British Atlantic World* (2009). Pestana teaches upper-level undergraduate classes on Colonial America and Tudor Stuart England as well as the first year U.S. history survey. She will again teach a freshman honors seminar on Jamestown in fall 2009. Active in the department’s graduate program, Pestana currently advises one doctoral and four Master’s students. Her former M.A. student Kris Kujawa Hawkins wrote a thesis on the Quaker book of Sufferings, and won the Midwest Association of Graduate School’s best thesis of the year for 2008. She mentors numerous undergraduate students, including two current honors students. The Folger Shakespeare Library in Washington, D.C. recently asked her to direct a seminar for faculty and advanced graduate students. Co-teaching with David Shields, who is the McClintoch Professor of Southern Letters at University of South Carolina, she will create a course that considers texts relating to the history and culture of the early Caribbean.

---

Written by: **Emily R. Kuhn**  
2009, Graduating Senior  
Major: Strategic Communication

# OARS Research News

## Highlights on Miami Faculty Research

---

### Dr. Elisabeth Schussler, Assistant Professor, Department of Botany



#### The Connection Between Science and Learning

**Dr. Elisabeth Schussler** has been doing scientific research since her days as an undergraduate, but it wasn't until years later that she fully understood the intricacies of conducting scientific research. At Miami, she now focuses her research on how students of all ages learn about science and how they learn about plants.

"I started researching this topic because of my experiences as an undergraduate science major. I was a good student, knew my content well, even did undergraduate research, but I still didn't understand the realities of scientific research and how it progressed," Dr. Schussler said. "I found this out when I went to graduate school — I didn't appreciate the stops and starts, the long, slow process, and how lost you can feel."

After receiving a grant from the National Science Foundation, Dr. Schussler tested different instructional models in a Miami BMZ 115 (Biological Concepts) lab, facilitating student understanding of the nature of science. "We just completed implementing the project in fall 2008, and are analyzing the results now. We tried four different research-based ways of teaching the course, and now we get to see if one is really better than the other," Dr. Schussler said.

The research is primarily focused on the connection between science and learning, and how educators go about reaching their students and helping them to understand the intricacies and enormity that science can hold.

"As a biology researcher, I am concerned with investigating what students are learning and how they are learning it — and whether that learning is consistent with our learning goals for students," Dr. Schussler explained. "As a faculty member, and therefore a teacher, I am also concerned about whether my instruction is facilitating that learning in the best way."

In applying this research to Miami and other teaching institutions, Dr. Schussler is working to find ways that educators can better facilitate student learning about science and about plants. "In many cases this means searching for instructional methods that seem to work best for student learning, but it can also be ways to help students reflect on their own learning and find ways to improve it," Dr. Schussler explained.

Dr. Schussler also works with psychologists on Miami's campus to find empirical evidence that people naturally notice and know more about animals than they do about plants, and if there are any conditions under which people do learn about plants. "I have always been fascinated by how animal-centric our society is and how people ignore plants. The emphasis on animals is so culturally pervasive that it seems to be deeply rooted in the way our brains work," Dr. Schussler said.

In addition to working with students at Miami, Dr. Schussler has worked with the local Talawanda school district to discover how teachers educate their students about plants in elementary schools. Dr. Schussler is analyzing the difference in presentation between plants and animals in elementary science textbooks. "As you might imagine, it isn't pretty for the plants," Dr. Schussler joked.

Prior to coming to Miami in 2005 as an assistant professor, Dr. Schussler was the Education Coordinator of the Ruth Patrick Science Education Center at the University of South Carolina Aiken. She obtained her B.S. from Vanderbilt University in biology and her Ph.D. from Louisiana State University in plant biology, where she also worked as a biology instructor.

---

Written by: **Emily R. Kuhn**  
2009, Graduating Senior  
Major: Strategic Communication

# OARS Research News

---

## Mickey Sarquis, Director, Center for Chemistry Education

**“When you capture a teacher, you capture a generation...”**



This belief has led to a long and meaningful career in science education for **Professor Arlyne (Mickey) Sarquis**, whose work as a chemistry education researcher, science educator, and lecturer is world renowned. Teaching the abstract topic of chemistry can be challenging, but training teachers to make this subject exciting and relevant is Sarquis' specialty and her passion. Professor Sarquis came to Miami in 1977 and is the founder and director of Miami University's Center for Chemistry Education and Terrific Science Press, the award-winning publishing arm of the Center. Through Terrific Science Press, over 60 books and other resources for teachers, students, and families covering topics from chemistry and physics to health and environmental science have been published.

Since the mid-1980s, Sarquis and her staff have received \$16 million in external grants for research and educational outreach programs. Her research, workshops, publications, and teaching have reached tens of thousands of teachers and over a million students around the world. A few of the themes which guide Mickey's hallmark programs and accompanying award-winning publications:

**Teaching Science with TOYS** involves learning chemistry and physics content, hand-on activities, and inquiry-based pedagogical methods using toys and everyday objects;

**Partners for Terrific Science and Partnership for the Advancement of Chemical Technology** fostered interaction among industry scientists, teachers, and students to make science interesting, relevant, understandable, and accessible as a career path; and

**Risks & Choices and HealthRICH: Health Risks, Information, and Choices (HealthRICH)** improves understanding of environmental health science and helps teens make informed personal choices to reduce health risks based on scientific knowledge.

Through these programs Sarquis has developed a research-based protocol that provides teachers with the knowledge, confidence, and support they need to bring quality science instruction to their classrooms. The protocol is documented in the *Journal for Chemical Education*, “Recommendations for Offering Successful Professional Development for Teachers” (2001) and has been praised as the universal model and template for all teacher outreach and education programs.

The current HealthRICH project, funded largely by grants from the National Institutes of Health, is looking at impacts on student learning through informal science club interactions versus formal classroom teaching. Students in clubs and classrooms across the country are learning environmental health science so they can make informed personal choices to reduce health risks. Program materials use detective-style scenarios, magazine-style readings, and popular imagery to appeal strongly to the young teen audience. Preliminary evaluation shows positive trends in both settings.

Sarquis has been honored with many awards including Miami University's 2009 Benjamin Harrison Medallion, the American Chemical Society's (ACS) 2008 Helen M. Free Award for Public Outreach, the ACS Cincinnati Section Chemist of the Year (2006), National Chemical Manufacturers Association Catalyst Award (1994) and the Ohio Academy of Science Outstanding University Educator Award (1990).

She will retire in late 2009, but will continue to fulfill existing grant commitments and to impact teachers and students across the country with the message that “Learning is something that students do.... not something that is done to them.”

She will continue to be actively involved in an international collaborative research project that is examining the impact of embedding multimodal representations within writing-to-learn tasks to improve student learning in chemistry. The team is particularly interested in learning whether significant differences in results occur around the world and how the international chemistry education community might capitalize on advances achieved by the most successful education systems in the study.

---

Written by: **Amy H. Standar**  
Deputy Associate Director  
Center for Chemistry Education, MUM

# OARS Research News

---

## Dr. Elizabeth Bergman, Assistant Professor, GREAL

### Research on Arabic Language and Dialects



Research on Arabic language and dialects of Arabic was highly specialized prior to September 11, 2001, according to **Dr. Elizabeth Bergman**, Assistant Professor in the Department of German, Russian, and East Asian Languages. In recent years, interest has grown in this research and in its practical applications.

Dr. Bergman, an Arabic linguist, focuses on the similarities and differences that characterize Arabic as spoken in the 23 countries in the Arab League and elsewhere.

“A tension exists among Arabic dialects. Speakers of Arabic across the Arab world consider that they share a single language in spite of the differences between dialects,” she said. “Linguists can describe the linguistic features shared by dialects of Arabic. A core set of sounds (phonology), ways to build words (morphology), grammatical structures (syntax), and vocabulary (lexicon) characterize Arabic dialects. At the same time, dialects of Arabic exhibit obvious differences in phonology and lexicon and, to a lesser but still significant extent, in morphology and syntax. These similarities and differences can affect communication and help speakers identify where other speakers come from.”

“I am currently working on a project that describes the ways in which different dialects of Arabic treat words borrowed from other languages. Most Arabic dialects rely on a single strategy to treat borrowed verbs. Recently, however, another strategy has emerged. This strategy is innovative in the Arab world but bears some resemblance to the treatment of borrowed words in Maltese. Maltese, however, has been culturally and linguistically separated from the Arab world since approximately the 11th century,” Dr. Bergman explained.

Dr. Bergman’s research has applications for students of Arabic and outside of the classroom. “A student of

Arabic needs to be able to speak and understand other dialects of Arabic. For example, a student may begin their Arabic studies in Jordan and then move on to study Arabic in Egypt, as I did early in my career. Without this kind of knowledge, that student is likely to have some difficulty communicating with people.” Students who go on to work in government or the private sector may also need broader exposure to Arabic dialects, whether they specialize in a single dialect or supervise a group of specialists. Other areas in which Dr. Bergman has consulted include the justice system, helping to ensure that speakers of Arabic can communicate effectively in the political asylum process.

Despite the growing global importance of the Arabic language, scholars continue to encounter problems in conducting research. “Most of the dialects I work on are under-researched. When I was working on Algerian Arabic, the most comprehensive dictionary I could find was in French, published in 1858 and revised in the 20th century. Finding resources like dictionaries and grammars can take a surprising amount of work sometimes” Dr. Bergman explained. “And, when it comes to obtaining language data, through audio and video recordings, locating speakers from a particular Arabic dialect community is not always easy.”

Dr. Bergman was awarded a Summer Research Appointment for 2009, from Miami’s Committee on Faculty Research (CFR). Prior to coming to Miami in 2008, Dr. Bergman taught at Georgetown University. She earned both the Ph.D. and M.A. from the University of Michigan, and the B.S. from Georgetown University.

---

Written by: **Emily R. Kuhn**  
2009, Graduating Senior  
Major: Strategic Communication

# OARS Research News

---

## Dr. Nishani Frazier, Assistant Professor, Department of History



### Investigating the Civil Rights Movement

When people think of the Civil Rights movement, Cleveland, Ohio is not usually the first place that comes to mind. However, **Dr. Nishani Frazier** is discovering that Cleveland's chapter of the Congress of Racial Equality (CORE) had a large impact on the social movement that many don't realize.

"Black power emerged in Cleveland, Ohio through the actions and activities of CORE much earlier than we presumed black power emerged. It then went on to influence the national office and its activities around black power," Dr. Frazier said.

Dr. Frazier came to Miami in 2008 as an Assistant Professor in the Department of History, with a strong background in civil rights research. Having an educational history and family upbringing rooted in the Civil Rights movement, Dr. Frazier wanted to discover some of the building blocks of the movement.

"I was going to research CORE in the South, focusing on the Deacons of Defense; however, that didn't pan out and then I focused in on Cleveland, where my mother was a member, and I thought, 'Oh, this is good.'" Dr. Frazier said, "It worked out much better than I ever hoped because issues like nonviolent direct action, which most people presumed to be an issue of the 1960s actually emerged in the 1940s when there was a shootout in Cleveland involving some CORE members."

Focusing on a 30 year period from its formation in 1944 to 1972, Dr. Frazier uses bins of old papers she has collected along with personal interviews she has conducted to research the emergence of CORE and its impact. "I would like to place CORE in the larger movement toward black power more systematically than what has been done before. Usually CORE is like the stepchild to the civil rights movement. They are known for the Freedom Rides, and then you don't hear from them anymore. I want to give CORE a stronger place

in the civil rights movement and black power era," she said.

Before coming to Miami to teach, Dr. Frazier had a Miami connection, receiving the Miami University Heanon Wilkins Fellowship. Dr. Frazier describes the fellowship as "really important in terms of allowing me to wrap up and complete my earlier research."

Dr. Frazier's research has faced a few roadblocks. Few interviews exist of people involved in Cleveland CORE and its resistance during the time. So Dr. Frazier has conducted the vast majority of the interviews herself. However, "There are a number of people who passed before I could get a chance to speak with them."

"The Cleveland police have been less than cooperative. They have police archives, and when I asked about them, they responded, 'There is no 'race squad' or 'That's not something we have access to.' The existence of a 'race squad' is easily proven and thus such a statement is an outright lie," Dr. Frazier said. "If I am able to talk with police, they speak very defensively, saying things like, 'This was a different time' and many won't speak on the record. It can be quite frustrating."

In addition to her research, Dr. Frazier is a co-chair with Mary Jane Berman, director of the Center for American and World Cultures, and Western College archivist Jacky Johnston, for the 2009 Freedom Summer Conference and Reunion. Supplementing the events with academic overlays, Frazier will help attendees understand the impact the Oxford Freedom Summer had on the civil rights movement.

Prior to coming to Miami, Dr. Frazier received her B.A. from Spelman College, one of two all-female African American institutions in the nation. She received both her M.A. and Ph.D. from Columbia University in 20th century U.S. history with a focus on the Civil Rights movement.

---

Written by: **Emily R. Kuhn**  
2009, Graduating Senior  
Major: Strategic Communication

# OARS Research News

---

## Proposal Writing Workshop (Summer 2009)

The Office for the Advancement of Research and Scholarship (OARS) will sponsor a Summer Proposal Writing Workshop for faculty who are NEW to External Funding.

The workshop will consist of:

1. Hands on, interactive workshop with group meetings, approximately 7-8 times during the summer.
2. The identification of funding sources.
3. The step-by-step proposal development process, to include: writing each part of the proposal with on-going peer review by the workshop participants.
4. Building a proposal budget.
5. Learning about research compliance issues and the

Miami internal approval and submission process.

The meeting day(s) and time(s) will be selected based on participant availability. R.S.V.P. by **May 22, 2009** to Anne Schauer, by sending a letter of interest that describes your current research idea(s), and include the days/times you are **NOT** available to meet during the week to schauerap@muohio.edu.

Participants who complete the workshop and then submit a proposal to an external funding agency will receive \$500.

For more information, contact **Anne Schauer** at 529-3735.

---

## 2009 Miami Shoupp Award Recipients

Proposals for the 2009-2010 Shoupp Awards to initiate collaborative research projects with industry were reviewed by the Miami University Research Advisory Council (MURAC), at its meeting on **April 15-16, 2009**. The Shoupp Award program is sponsored by the Office for the Advancement of Research and Scholarship (OARS).

Recipients of the 2009 Shoupp Awards include:

- **Mary Benedict Bonham**, Architecture and Interior Design, "Lighting and Controls Demonstration Research Lab", (\$5,000).
- **Chi-Hao Cheng**, Engineering Technology, "Nonlinear Electronic Equalizer Structure for Next Generation Optical Communications Systems", (\$5,000).
- **Xiao-Wen Cheng**, Microbiology, "Screening a Chitinase Enzyme to Control the Dandruff-Associated Yeast *Malassezia*", (\$5,000).
- **Iddo Freidberg**, Microbiology, "The Use of Field Programmable Gate Array (FPGA) Technology for Genomic and Metagenomic Sequence Analysis", (\$5,000).
- **Lei Kerr**, Paper and Chemical Engineering, "Quantum Dots Sensitized Nanocrystalline TiO<sub>2</sub> Solar Cells", (\$5,000).
- **Richard T. Taylor**, Chemistry and Biochemistry, "Preparation of Bioactive Molecules through Click Chemistry", (\$5,000).

---

## NIH Limited Recovery Funds for the AREA-R15 Program

The purpose of the Academic Research Enhancement Award (AREA) program, of the National Institutes of Health (NIH), is to stimulate research in educational institutions that provide baccalaureate or advanced degrees for a significant number of the Nation's research scientists, but that have not been major recipients of NIH support (Miami University is eligible). The AREA grants create opportunities for scientists and institutions otherwise unlikely to participate extensively in NIH programs, to contribute to the Nation's biomedical and behavioral research effort. AREA grants are intended to support small-scale health-related research projects proposed by faculty members of eligible, domestic institutions. It is estimated that up to 50 awards will be made

in FY 2010. The total amount awarded and the number of awards made will depend upon the quality, duration, and costs of the applications received. Applicants may request up to a total of \$300,000 direct costs plus applicable Facilities and Administrative (F&A)/ indirect costs. The modular budget for direct cost amounts up to \$250,000 and the detailed budget for direct costs amounts above \$250,000 will be used. The total project period for an application submitted may be up to three years. The deadline for applications is **September 24, 2009**. For the program announcement go to: <http://grants.nih.gov/grants/guide/rfa-files/RFA-OD-09-007.html>.

# OARS Research News

---

## Miami University Interdisciplinary Technology Development Challenge (MUITDC) Program for Undergraduate Students

### “Clean and Alternative Energy Systems” (Entry Deadline: September 15, 2009)

**Objective:** This contest fosters interdisciplinary research by providing an opportunity for teams of undergraduate students to develop and demonstrate a technology at the laboratory scale, to provide fiscal projections that indicate financial viability, and to identify policy issues that incorporate esthetic and societal concerns.

**Background:** In the broadest sense, “Clean and Alternative Energy” refers to the use of any source of energy intended to replace or improve the efficiency of traditional fuel sources without the undesired consequences of those fuels.

This year’s Challenge addresses technology development needs related to the recently approved State Energy Policy (Ohio S.B. 221) which establishes alternative energy benchmarks for electric distribution utilities and electric services companies, requiring the generation of no less than 12.5% of Ohio’s energy needs with alternative energy technologies by the year 2024.

Examples of clean and alternative energy systems include electric vehicles, solar and wind power, fuel cells, bio-fuels, and off peak storage systems or distributed generation facilities using renewable resources. Technologies that

lead to higher efficiency of energy use and reduce carbon emissions (e.g., building design, HVAC improvements) will also be considered.

For more information contact the Office for the Advancement of Research and Scholarship (OARS) or visit the OARS web site for further details <<http://www.muohio.edu/oars/>>.



As the semester comes to an end and summer begins, faculty and staff may want to see me to discuss their current research and scholarship projects so that we can update the grant funding information that is sent to them. As the information will most likely come to you electronically, it would be best if we work together at your office computer. All you need to do is send an e-mail to me ([kisshg@muohio.edu](mailto:kisshg@muohio.edu)) or call at 529-3600 to set up an appointment. Together we will discuss the type of funding for which you are looking. For example you may

be interested in curriculum development, travel, research supplies, scholarships, and/or equipment, just to name a few items. We will also explore the OARS Website, which has detailed information on how to go about applying for an external grant, and how we can assist you in the process. There are other professional funding Websites that you may not be aware you have access to locate funding opportunities. Many of these sites provide electronic funding alerts directly to your e-mail address after you have selected key words or terms fitting your research and scholarship needs. We can show you these sites and assist you in signing up for funding alerts that fit your interests. **Helen G. Kiss, Assistant Director & Information Coordinator, 529-3600.**

---

### Upcoming OARS Events and Deadlines:

June 2009 Summer 2009 Proposal Writing Workshop, contact Anne Schauer, 529-3735  
Summer 2009 NSF CAREER Seminar/Workshop- (will be posted on the OARS Web site)

---