

CSAM NEWSLETTER

College of Science and Mathematics

A Spectrum of Possibilities

New BS/MS Aquatic and Coastal Sciences Program Offered

In October, the New Jersey Presidents' Council approved a new program in Aquatic and Coastal Sciences at Montclair State University. This combined five-year bachelors and masters degree is an interdisciplinary program of study that emerges from two departments - Biology and Molecular Biology and Earth and Environmental Studies. A research requirement at both the undergraduate and masters level also addresses the strategic goal of providing rigorous training in this important discipline.

This program will work collaboratively with the Passaic River Institute, the School of Conservation, and the doctoral program in Environmental Management to provide students with opportunities to develop research and educational prowess. The program's main objectives are to provide a well-defined, comprehensive knowledge of the disciplines associated with the aquatic sciences; provide appropriate training for professional employment or as preparation for the pursuit of the doctoral degree; and provide students with research experience that will include project development and implementation, data gathering, analysis and interpretation, and publication.

Graduates of the program will meet an array of workforce needs including fisheries biologists, environmental scientists, limnologists and oceanographers. Possible employers include federal governmental agencies (such as U.S. Environmental Protection Agency, National Oceanographic and Atmospheric Administration, and U.S. Army Corp of Engineers), state and local agencies (such as Soil Conservation Districts, Water Treatment Plants, and Health Departments), as well as private sector companies involved with environmental issues and permits.

This program will officially begin in the Fall of 2006. Additional information regarding this program is available at <http://www.csam.montclair.edu/bs-ms-aquatic.html> or by contacting Dr. Bologna, Program Director (Biology and Molecular Biology) at 973-655-4112 or bolognap@mail.montclair.edu.

Students to Conduct Research in the Amazon and Caribbean

Montclair State University has partnered with Cornell University to offer students a unique opportunity to conduct summer field research in the Dominican Republic and Peru. Through the Minority Health & Health Disparities International Research Training (MHIRT) Program, housed at Cornell, students are offered an opportunity to participate in research related to the investigation of complex ecological interactions in the tropical forest, deserts, and coral reefs mediated by natural substances of medicinal value. Through this research program, students learn about a wide range of topics related to biodiversity studies, including chemical ecology, conservation, natural products chemistry, marine biology, biomedicines, ethnomedicine, and health disparities. A main thrust of the research is on the wealth of biomedicines derived from terrestrial and marine plants, arthropods, fungi, and microbes which constitute the biodiversity of the tropical world.

The 2006 program offers placements at two field stations. In the Dominican Republic, work will include investigations at the Punta Cana Biodiversity Laboratory and the Center for Tropical Disease Control in Santo Domingo (CENCET). In the Amazon region of Peru, students will train at the University of the

In this issue:

From Dean Prezant.....	2
CSAM Advisory Council.....	2
Thai Scientist Collaborates with CSAM.....	3
CSAM Welcomes Chinese Scholar.....	4
PRI Awarded Grant.....	4
NASA Earth Observing System.....	4
Alumna Reflects on MSU Years.....	5
Sun Microsystems Academic Excellence Grant	6
CSAM Hosts Northern NJ Science Olympiad.....	7
"A Poet With a Knife"	7
Nobel Laureate to Speak at MSU.....	8
Multi-State Conference.....	8
Publications.....	8-10
Presentations.....	10
Kudos.....	10
Staff Changes in Mathematical Sciences.....	11
Calendar of Events.....	12

continued on next page

From Dean Prezant



In this issue of the CSAM Newsletter you are introduced to our CSAM Advisory Council. With CSAM's growth, new frontiers, exceptional new faculty and facilities, links to industry and growing research programs, the need for an external advisory council became evident. The goal was to bring together a group of leading professionals that reflect disciplines within

CSAM. We wanted to insure we had members from industry, science institutes and museums, consultancies, and academia and members that cover disciplines ranging from pharmaceuticals to information technology to environmental management to science education.

We've been exceptionally fortunate to have successfully brought a team together that represents not just leaders in their fields, but remarkably astute, intuitive and focused individuals who are making a difference for CSAM. In part we have asked the Advisory Council to help us look to the future and help us insure that we are doing all we can for our students. Discussions have been lively, informative and exceptionally helpful. But the extent of the dedication of our Council members goes well beyond brainstorming.

The College of Science and Mathematics has developed a new speaker series, the CSAM Science Professionals Speaker Series. We are inviting highly successful individuals from outside of the Academy to meet with our students. The speakers will offer an informal "story" of how they got to be where they are and then remain to spend time answering questions and just talking with our students. We hope our CSAM students find these stories inspiring. Our goal is to cover a wide array of disciplines in math and science so that all of our students will eventually have a "model" to engage. And what does this have to do with our Advisory Council? Our first five speakers are all members of the CSAM Advisory Council. Dr. Emlyn Koster will kick off the series on February 13, at 6:30 p.m. Our CSAM Advisory Council, just as our faculty members, is extending that extra effort to afford our students those "quality added" opportunities to better prepare for the future. A spectrum of speakers...*A spectrum of possibilities.*

continued from page 1

Amazon in Iquitos and conduct field research at the Cornell Es-Baran Research Laboratory and Station on the Yarapa River.

Each student participant will contribute, through field and biochemical laboratory work, to the research on biodiversity, drug discovery and health disparities. Additionally, each participant will develop, over the course of the program, an individual research project related to biomedicines. For the individual project, each participant will collect field and biochemical laboratory data, give oral presentations at national conferences, and prepare a formal research paper to be published in *Emanations*, an undergraduate online research journal published by Cornell University.

The program is open to undergraduates of sophomore or junior standings with a minimum GPA of 3.0 and graduate students interested in biomedical sciences, natural product chemistry, alternative medicine, and biological sciences. Sixteen MSU students were among the over 100 applicants for the summer 2006 program. It was anticipated that only two or three MSU students would be selected. However, based on their strong academic background, stated research plan, faculty recommendations and interview, six MSU undergraduate students have been selected and will be conducting their summer research at the Punta Cana Biodiversity Laboratory. They are: Diane Barrett (Nutrition & Food Science), Marcel Castor (Biology), Mario Giron (Biochemistry), Adasha Lockhart (Chemistry), Rojita Sharma (Biochemistry & Science Informatics), and Martha Torres (Biology).

CSAM Advisory Council

The College of Science and Mathematics established an advisory council in 2005 whose mission is to provide guidance, support and advocacy for the College's pedagogical, research, and outreach programs. The Council assists the College in maintaining discipline currency with changing educational, economic, national and international needs; helps identify emerging directions for research and educational programs, as well as sources for student support, program research collaboration, funding, and other professional opportunities; and helps promote the College with the external community.

The Council is currently composed of 13 voting members, representing industry, not-for-profit organizations and educational institutions. During its semi-annual meeting in November 2005, Dr. Emlyn Koster, President and CEO of the Liberty Science Center was elected chairperson of the Council. The Council members are:

- Dr. Barbara Brummer, Executive Director, The Nature Conservancy of NJ;

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continued from page 2

- Mr. Ronald Califre, Senior VP and Head U.S. Operations Research and Development, Novartis Pharmaceuticals;
- Ms. Irene Dec, VP and Head of International Operating Management, Prudential Insurance Company of America;
- Ms. Yvonne Hodge, VP Quality, Ethics and Mission Success, Lockheed Martin Naval Electronics & Surveillance Systems;
- Mr. Mark E. Kolb, Chairman and CEO, Taratec Development Corp.;
- Dr. Emlyn Koster, President and CEO Liberty Science Center
- Dr. Paul Lioy, Professor, Environmental & Occupational Medicine, UMDNJ - Robert Wood Johnson Medical School;
- Ms. Meme Omogbai, Chief Operating Officer, Newark Museum;
- Mr. Dennis Petrocelli, Senior VP, Matrix New World Engineering, Inc.;
- Dr. Bradley Sheares, President, U.S. Human Health Division, Merck & Co.;
- Dr. William Tansey, Cardiologist, Summit Medical Group;
- Ms. Teresa Vega, Senior VP, Motorola; and
- Dr. Maria Webb, VP Pre-Clinical Research, Biological, and Pharmacological Sciences, Pharmacopeia.

As a regular feature of our Newsletter, we will run a short biography of one member of our council. In this issue, we will start with the chair of the Council, Dr. Emlyn Koster.



Emlyn Koster, Chair CSAM
Advisory Council

Born in Egypt's Suez Canal Zone and then moving to England, Dr. Koster obtained a BS in geology at the University of Sheffield. In 1971, he immigrated to Canada and earned his PhD in geology at the University of Ottawa. Faculty positions in Montreal and Saskatchewan followed. Then, after coal exploration and dinosaur fieldwork in a UNESCO World Heritage Site in Alberta and in China's Gobi Desert, his career focus shifted to the public's view of science. From 1986-91, he directed a new natural history museum near Cal-

gary, with Queen Elizabeth II bestowing royal appellation upon it in 1989. From 1991 to 1996 as CEO at the Ontario Science Centre in Toronto, a pioneer among interactive museums, he led a major facility and exhibition renewal programs.

His 40+ publications in the museum field are on topics he believes ought to be at the forefront of its thinking- namely, its relevancy to social and environmental opportunities and challenges. In 1999, he was part of an invited collection of essays on museums in community contexts by the American Academy of Arts and Sciences. In 2001, he co-edited a collection of interna-

tional papers entitled Science Centers for this Century, published in Canada. In 2002 he was the keynote speaker at the Canadian Museums Association annual conference and in 2003 he received the John Cotton Dana Award from the New Jersey Association of Museums. During 2004, he was an invited speaker at major science, technology and society conferences in Colombia, Costa Rica, Arizona and Maryland. Other recent involvements include being an invited resource to the boards of the Canadian Museum of Nature and the UK's National Museum of Science and Industry. In 2005, he was an organizer of two sessions at the Fourth Science Centre World Congress in Rio de Janeiro and an invited keynote speaker at Mexico's national colloquium on science centers. In 2006, he is a invited keynote speaker at the conference of the Asia-Pacific Association of Science Centers in Perth, Australia.

Thai Scientist Collaborates with CSAM

Dr. Nittaya Chaiyanate, Associate Dean of the Faculty of Sciences at Burapha University, Chonburi, Thailand, spent the end of November to the end of December 2005 at MSU as a visiting scientist. Dr. Chaiyanate, who received her Ph.D. from Ehime University (Japan), has expertise in sediment contamination and macrobenthic community responses as well as micronutrients as they pertain to shrimp aquaculture.



Dr. Chaiyanate at Indian Run collecting
specimens of the bivalve *Corbicula*

During her visit to MSU, Nittaya worked with Drs. Robert Prezant and Michael Kruege on potential uptake of PAHs (polycyclic aromatic hydrocarbons) in the shell of the Asian clam *Corbicula fluminea*. This work brought Nittaya, through the guidance and field knowledge of Eric Chapman, to a variety of streams and lakes in New Jersey, some quite beautiful and some highly contaminated. Sample results indicate that this may be the first evidence of uptake of these water and soil contaminants in shell material and could serve as an important pollution indicator.

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continued from page 3

While the studies (with strong technical assistance from Kevin Olsen) remain in early phase, there are indications that PAHs are picked up at low levels in the organic material that composes part of the molluscan shell material. Dr. Chaianate plans to continue the work on the analysis of these contaminants in other organisms back in Thailand and hopes to return to MSU in the future to extend this preliminary research.

CSAM Welcomes Chinese Scholar

Professor Bingtuan Wang from Beijing Jiaotong University (BJTU) is a visiting professor at the department of Mathematical Sciences from December 2005 to June 2006. During his visit, Professor Wang will collaborate with Dr. Aihua Li on several education/research projects. In addition, he plans to start writing a book on mathematics modeling and develop a research project approachable for both undergraduate and graduate students in China.

Professor Wang received his masters degree from the University of Science and Technology Beijing (USTB) in 1988 and taught at (USTB) from 1988 to 1998. He began teaching at BJTU in 1998 and was awarded a full professorship in 2004. He is the author of 12 research articles and 4 books about mathematics modeling, computation, experiments and software. In China, Professor Wang is highly recognized for his leadership in coaching, organizing, and directing college students to succeed in the popular Chinese University Mathematics Contest in Modeling CUMCM). His team has received numerous awards at national and international levels and has been ranked among the top ones in China.

Professor Wang is also interested in developing university-wide relationships between MSU and BJTU. One plan of his is to initiate a program for professors in American colleges to train Chinese faculty to teach science subjects in English. In January 2006, he helped CSAM with the Science Olympiad event: "Compute This!". We wish him a successful and pleasant time at MSU.

PRI Awarded Grant To Study Effect of Urbanization on Surface NJ's Water Supply

The Passaic River Institute was recently awarded a grant from the US Dept. of Agriculture National Research Initiative Competitive Grants Program. The project is entitled "Is urbanization of rural, water supply watersheds a threat to water availability during dry weather in New Jersey? A historical, empirical analysis of the relationship between imperviousness

and stream baseflow."

During dry weather, replenishment of water supply reservoirs depends on flow in streams that is supplied by groundwater, termed baseflow. The accepted theory is that as urbanization (replacement of vegetated, pervious surfaces with imperviousness surfaces like pavement and rooftops) increases, less rainfall soaks into the ground, reducing stream baseflow and flow into reservoirs during dry weather. The project will empirically investigate how strongly urbanization and its attendant increase in imperviousness has been related to decreases in stream baseflow over the past 50-100 years in New Jersey, concentrating on rural (but urbanizing) water supply watersheds. The analysis will include the Wanaque, Pequannock and Rockaway River watersheds, which are tributaries to the Passaic River, and the watershed of Spruce Run Reservoir. The reservoirs in these watersheds provide drinking water to millions in northern and central New Jersey. The project could help water supply managers assess the threat posed by urbanization and help them develop policies accordingly to protect surface water supply during drought. PRI Director, Dr. Kirk Barrett, is serving as Principal Investigator. The project was one of only 14 selected for funding out of 179 proposals received.

NASA Earth Observing System Project Update

By Mark Chopping, Earth and Environmental Studies

Our NASA EOS project addresses new approaches to exploiting data from the Multi-angle Imaging Spectro-Radiometer (MISR) and Moderate Resolution Imaging Spectroradiometer (MODIS) for mapping desert grasslands in the southwestern US. The project started in the summer of 2004 and the team includes Drs. Mark J. Chopping (PI) and Lihong Su (Research Associate) in the Department of Earth and Environmental Studies; Dr. John V. Martonchik (NASA Jet Propulsion Laboratory); and Drs. Albert Rango and Debra P. C. Peters (USDA, Agricultural Research Service Jornada Experimental Range). At the end of the first year of our project we presented the preliminary results at two NASA science team meetings, as well as at the American Geophysical Union (AGU) Joint Assembly in New Orleans. (It was particularly poignant - not to mention surreal - for myself, Dr. Su and graduate students Ben Witherell and Jennifer Haag, to witness the images of residents waiting for rescue outside the Ernest N. Morial Convention Center in the days after Hurricane Katrina struck. This was the same building that we frequented every day for the week of the AGU meetings.)

So what have we learned so far? We have made significant progress in exploiting multi-angle Earth Observation data from MISR and MODIS in geometric optical (GO) canopy reflectance model

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-ing and in mapping semi-arid desert grassland communities. We developed a new method for determining the background response and tested our model with observations in the Jornada Experimental Range near Las Cruces, New Mexico. We found that we could provide accurate measures of the background response and used our new method to drive the GO model using shrub maps derived from analysis of very high resolution IKONOS panchromatic imagery. We obtained excellent simulations of MISR data. We also performed research on the use of support vector machine (SVM) algorithms for classification of MISR and MODIS data sets to plant community types in the Jornada Experimental Range and the Sevilleta National Wildlife Refuge, New Mexico.



NASA Land Cover Land Use Change Science Team meeting Mark Chopping is 4th from left in the first row.

Our project was very active in the last 6 months of 2005 culminating in an annual report, presented to NASA, inclusion of data in MISR quarterly report and a new NASA LCLUC brochure. In September 2005, I led a NASA-sponsored workshop on Ecological Modeling using NASA Multi-angle Remote Sensing. The workshop attracted some key scientists from both the ecological modeling and remote sensing communities with participants in attendance from diverse institutions including Harvard University, the University of Toronto, NASA Goddard Space Flight Center, the University of New Hampshire, University of Maryland, George Mason University, and NASA Jet Propulsion Laboratory (see the November-December edition of *The Earth Observer*, available from the EOS Project Science Office, (http://eospsso.gsfc.nasa.gov/earth_observer.php).

Alumna Reflects on MSU Years

My name is Anna Cartier. I emigrated to NJ from Poland in the early nineties. (You might ask the question why NJ? It is simple; because my sister lived here and she was the one that sponsored my trip.) In my first years here I had to learn many new skills that one takes for granted simply be-

cause they are a part of everyday life. As soon as I arrived I had to go to work, pay bills, and buy and cook my own food. There was no time for school. I struggled and quickly realized that without an education I will never feel a part of this new country or live a better life. I began very slowly by taking two courses per semester at Bergen Community College. These were evening courses since I was forced to work during the day. I was usually tired in the evening but I enjoyed most of my classes. As I worked, I remembered that I am doing this to pay my tuition and get my education! Taking English writing courses was essential at the time and took a lot of effort. After a year I took a biology course and found myself fascinated with the chapter on molecular properties of water.

I learned quickly that the focus of my studies should be the biological sciences. Science courses required for the completion of a four-year college degree, however, were only offered during the day. I had to restructure my life in order to make it happen. It wasn't easy and it did not happen right away but I took every opportunity both personal and professional to bring myself closer towards this goal. Finally, after six long years in the US, I was officially enrolled in a four-year molecular biology program at MSU.

I still get emotional when I think of these first days after receiving a letter of acceptance and signing up for my first classes at MSU. The future became very fluid and I could not predict the outcome of my decision. Will I succeed or fail? Am I strong enough to follow through? Everything became uncertain. I was scared. As a female I had to put aside the desire to have a family and my personal relationships. Getting a degree became my priority. I knew that in this way I would attract the friendship and partnership of new people; people who would respect my love for knowledge and appreciate the passion I have for scientific inquiry.

I started my first semester at MSU with my favorite topic, plants, with Dr. Vanderklein. I absolutely enjoyed every single lecture. I realized then that I have a passion for plant life and that I should use it as a driving force to help me get through my studies. As a part of our plant course requirement we had to complete a research project on live plants grown in the MSU greenhouse. We had to take some measurements and expose the plants to various treatments that would affect their physiology. That first day in the greenhouse when I picked up the scissors and clipped my first leaf I knew that I would spend most of my time at MSU working with Dr. Vanderklein and taking care of the greenhouse. I helped him move all the plants to the new facility in Science Hall and took care of them to make sure they adapt to their new environment. (Some of those plants are still in the lobby of Science Hall!)

I started my first plant physiology research project with Dr. Vanderklein in the second semester of my studies and con-

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continued from page 5

tinued to work for him for the next two years. At the end of my second semester, I participated in my first scientific research conference organized by our local chapter of Sigma Xi. After a full summer of greenhouse and field research in Long Island Pine Barrens, I attended the Metropolitan Association of College and University Biologists conference where I had a chance to interact with students from other universities in the metropolitan area. From that moment on I was actively engaged in scientific projects in the Biology and Molecular Biology department until I completed my undergraduate degree in December 2004.

In the second spring semester of my studies I competed with students from many other states for a Plant Molecular Biology summer research program at the University of Massachusetts (REU program). I was accepted due to my good references from my mentors and a high GPA. The UMass project offered a generous stipend, paid all the expenses, and most of all provided me with the training in various molecular techniques that allowed me to build a “solid” resume in a very short period of time. In the last two years of my studies, I worked with Dr. Campanella on *Arabidopsis thaliana* and Dr. Vega on kidney development in order to familiarize myself with molecular research methods necessary for my future work at the graduate level. I also decided to broaden my research experience beyond the limitations of my major. I worked during the summer months with Dr. Prezant on the benthic diversity of the Bronx River estuary.

I regularly presented all of my research at scientific conferences. Attending these meetings was one of the most pleasant experiences I had during my studies at MSU. These were the moments of great excitement, moments filled with positive energy when all the students could share their work and feel a sense of accomplishment. The meetings always allowed us to bond with our research mentors in a more personal setting, provided us with speakers on very interesting and up-to-date scientific topics and –always important– great food! All the work put into a presentation was worth it in the end. Participation in the scientific conferences served as closure for the current stage of my project and allowed me to prepare mentally for the new challenges.

I made a conscious effort to find something interesting in every course I took and whenever possible to use my passion for plants in my other courses. For example, in Speech Communication, I compared a cactus and a tropical plant as an assignment. I also used the knowledge from my molecular biology readings to prepare a presentation on language genes in a Linguistics course and applied the research on genetically modified rice in Food and People course.

I am currently a fulltime PhD student at UC-Davis with a full research assistantship and a generous monthly stipend. I owe all this to my CSAM professors and thank them for giving me the skill, confidence and experience needed. I feel fortunate to have been a part of the CSAM and MSU communities.

Sun Microsystems Academic Excellence Grant Awarded

By Dr. Stefan A. Robila, Department of Computer Science

In November 2005, the Department of Computer Science received an Academic Excellence Grant (AEG) from SUN Microsystems, Inc.

SUN is donating equipment, valued at \$34,155, for a rack-based Sun Fire V40z 4CPU 16GB RAM server along with a Sun Java Workstation W2100z Dual Opteron Processor bundled with high end graphics capabilities. This equipment will significantly strengthen Dr. Robila's Remote Sensing Laboratory ensuring its position on the cutting edge of research and education in image processing and remote sensing.

The project deals with the development of efficient hyperspectral image processing and visualization methods in a multiprocessor environment targeted at bio-medical imaging. The use of Sun technology is essential in the success of the project. The Sun Fire V40z server will have a dual purpose, acting as a data server for the project and being employed in the development of a parallel/scalable processing toolkit for the hyperspectral data. The server's architecture will allow for significant speedup in processing, an important achievement when up to date results are needed. The Sun Java Workstation W2100z will be used for the initial processing and data visualization. The dual AMD Opteron coupled with NVIDIA Quadro graphics accelerator provides superior visualization capabilities for complex data and large images such as the ones used in this project. The project will also impact the educational diversity of the Department of Computer Science by involving undergraduate and graduate students in the development of the application and exposing them to state of the art computing environment.

The Remote Sensing Laboratory is part of the Center of Imaging and Optics (CIO), entity that groups several Computer Science faculty with research interests in imaging, optics, and graphics. Founded in 2004 with support from The International Society for Optical Engineering (SPIE), CIO has established itself as a viable entity in the region through the organization of an imaging workshop, hosting guest lectures, and attracting two SPIE Educational Grants.

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<http://csam.montclair.edu>

CSAM Hosts Northern NJ Science Olympiad

For the third year, the College of Science and Mathematics sponsored and hosted the Northern NJ Regional Science Olympiad Tournament. Six hundred students from 17 middle schools and 18 high schools, a host of coaches, and parents buzzed and milled around the Student Center, Mallory, Richardson and Science Halls on January 12, 2006. According to Dr. Jinan Jaber, Assistant Dean – CSAM and regional tournament director, this year's competition consisted of 15 and one-for-fun events, at each level, for a total of 32 events. Thirty MSU faculty and students spent their day off as supervisors for twenty two events. The other events were supervised by volunteer scientists from Hoffmann-LaRoche, Rutgers Protein Data Bank, Reckitt Benckiser, ExxonMobil, PSEG, FMC and Pfizer and faculty from Princeton and County College of Morris.



Eisenhower M.S. (Wyckoff) team gets ready

The events consisted of paper and pencil tests in Fermi Questions, Astronomy and Ecology, to examining and reporting on samples in Designer Genes and Food Science, to building and testing models in Bridge Building, the Wright Stuff, Robot Rumble and Bottle Rocket. This year's trophy winners in the middle school division were: 1st place - Pioneer Academy, 2nd place - Eisenhower MS and 3rd place - Ranney School. And, for the high school division, the first place winner was Livingston HS, 2nd place - Montville Twp HS and 3rd place - Millburn HS. Seven middle school teams and 9 high school teams have advanced to the state tournament to be held in March at Middlesex County Community College. Congratulations to all!

"A Poet With a Knife"

By William M. Phillian, contributor to CSAM Newsletter

Even without the combined threats of terrorism, random violence and natural disasters, life is under siege by an environment that seems to be constantly at odds with the well being of humankind. Despite the efforts of the Green move-

ment and long since the advent of Earth Day, the environment is guilty of the crime of "toxic trespass."

Dr. Sandra Steingraber heralded that pronouncement in her lecture entitled "Contamination Without Consent" on October 26, 2005, before a capacity crowd in the Kasser Theater. It was the University's seventh Margaret & Herman Sokol Lecture, in a series made possible by the sustaining support of Mrs. Margaret A. Sokol whose late husband Herman developed the breakthrough antibiotic, tetracycline. A prolific author, professor, ecologist and cancer survivor, Dr. Steingraber's credits include a volume of poetry. Her more well-known book is *Living Downstream- A Scientist's Personal Investigation of Cancer and the Environment*. Growing up in a small town in central Illinois, she learned first-hand of the tangled web of environmental pollution. Among her discoveries was the irony that the town dump contained waste from a distant part of the country known as the Garden State.



Dr. Steingraber autographs "Living Down Stream" for MSU students

Earning a doctorate in biology and a master's degree in English, Dr. Steingraber assumed the role of environmental sleuth. A "poet with a knife," as she has been called, she tracked down, researched and wrote about the links between the environment and human health. Meeting with a small group of science students in Richardson Hall before her lecture, Dr. Steingraber displayed a strong knowledge of the issues and a sincere interest in students, all with an easy, down-to-earth demeanor that reflected her small town roots.

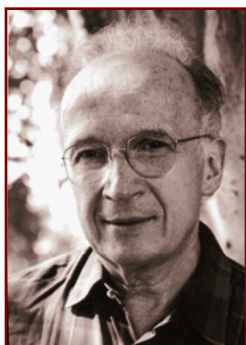
Becoming a mother late in life, she developed an interest in environmental dangers to the unborn, to children, to women and to reproductive health. It used to be said that "The dose makes the poison," but now, as Dr. Steingraber explained, "The timing can

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continued from page 7

make the poison.” She cited lower sperm density as one of the dangers of cigarette smoke, and described a “nexus between a woman’s fertility and public policy on smoking.” Studies in California, she noted, have linked proximity to farms using pesticides to an increased number of stillbirths. The link between bladder cancer and the environment, Dr. Steingraber stated, is well known.

Although, as she put it, “We’ve been able to handle lead, the big problem we’re facing now is mercury.” She highlighted the presence of mercury in coal. A derivative, methyl mercury, is a toxin that is “very potent and gets in the food chain.” Then came a startling observation: “The number of kids in special education is related to how we generate energy.” If that weren’t the worst of it, Dr. Steingraber revealed that rocket fuel has been found as a contaminant in breast milk. One can’t help but believe that the continuing efforts of Sandra Steingraber to root out the facts and to inform the public are essential to the well-being of the environment, ourselves and our offspring.



Nobel Laureate to Speak at MSU

The Spring 2006 Sokol Science Lecture will present Dr. Roald Hoffmann on Thursday, April 6, 2006. Dr. Hoffmann studied chemistry at Columbia and Harvard Universities (Ph.D. 1962). He has been at Cornell University since 1965, currently as Frank H. T. Rhodes Professor of Hu-

mane Letters. He has received many of the honors of his profession, including the 1981 Nobel Prize in Chemistry (shared with Kenichi Fukui) and the 1990 Priestley Medal. Dr. Hoffmann has over 500 published papers in chemistry.

Dr. Hoffmann is also a writer of essays, non-fiction, poems and plays. His published works include poetry collections: *The Metamict State*, *Gaps and Verges*, *Memory Effects*, *Soliton*, and *Catalista: Poemas Escogidos*; *The World of Chemistry* (a video series); *Chemistry Imagined*, with Vivian Torrence; *The Same and Not the Same*; and *Old Wine, New Flasks: Reflections on Science and Jewish Tradition*, with Shira Leibowitz Schmidt.

His lecture titled “Chemistry’s Essential Tension: The Same and Not The Same” will be held at the Kasser Theater at 8 p.m. Tickets, available through the theater box office, are free to the MSU community and \$10.00 for others.

Multi-State Conference: “Stream Restoration and Protection in The Mid-Atlantic Region” to be held at MSU

The Annual Conference of the Mid-Atlantic Sections (NJ, NY, PA, DE and Philadelphia) of the American Water Resources Association will be held at the New Jersey School of Conservation, an environmental education camp operated by Montclair State University on a 240 acre campus within near-pristine Stokes State Forest in northwest New Jersey. The location promises a unique conference experience, far different from an urban/suburban hotel. A small lake on the campus offers canoeing and license-free fishing, one of NJ’s best trout streams is adjacent to the property, and hiking opportunities abound. Along with presentations and posters, tours and workshops are planned to take advantage of the site’s facilities and setting. A conference announcement is now available at www.awra.org/state/new_jersey/mac2006. PRI Director Dr. Kirk Barrett is serving as chair for the conference.

Publications

Cummings, D.A.T., I. B. Schwartz, **L. Billings**, et al. (2005). “Dynamic effects of antibody dependent enhancement on the fitness of viruses.” *Proceedings of the National Academy of Sciences*, 102, pp. 15259-15264.

Piccolo, C. and **L. Billings** (2005). “The effect of vaccinations in an immigrant model for Rubella.” *Mathematical and Computer Modelling*, 42, pp. 291-299.

Bologna, P. A. X. (2005). “Assessing within habitat variability in plant demography, faunal density, and secondary production in an eelgrass (*Zostera marina* L.) bed.” *Journal of Experimental Marine Biological Ecology*. In press.

Bologna, P. A. X., M. Fetzer, S. McDonnell and E. Moody (2005). “Assessing the potential benthic-pelagic coupling in episodic blue mussel (*Mytilus edulis*) settlement events within eelgrass (*Zostera marina*) communities.” *Journal of Experimental Marine Biological Ecology*, 316, pp. 117-131.

Feng, H., L. Yu and W. Solecki (eds.) (2005). *Urban Dimensions of Environmental Change -Science, Exposure, Police, and Technologies*. In press.

Feng, H., V. Onwueme, L. Schneider (2005). “Classification and environmental quality assessment in aquatic environments.” *Encyclopedia of Water*. In press

- Jones, K. W., **H. Feng**, A. Lanzirrotti and D. Mahajan (2005). "Synchrotron x-ray microprobe and computed microtomography for characterization of nanocatalysts." *Nuclear Instruments and Methods in Physics Research Section B: Beam Interactions with Materials and Atoms*. In Press.
- Feng, H.**, X. Han, W. Zhang and L. Yu (2005). "Sediment erosion and non-steady sedimentation in southern Yangtze River intertidal flats: Preliminary study results." In: *Urban Dimensions of Environmental Change - Science, Exposure, Police, and Technologies*. Feng, H., L. Yu and W. Solecki (eds.), pp. 17-24. In press.
- Onwueme, V., **H. Feng**, **M. Chopping**, W. J. Jaslanek and E. A. Stern (2005). "Heavy metal contaminated sediments of Lower Passaic River, New Jersey, USA." In *Urban Dimensions of Environmental Change - Science, Exposure, Police, and Technologies*. Feng, H., L. Yu and W. Solecki (eds.), pp. 34-43. In press.
- Feng, H.**, V. Onwueme, et al. (2005). "Application of Geographical Information System (GIS) to Lower Passaic River Sediment Pollution Study, New Jersey, USA." In *Urban Dimensions of Environmental Change - Science, Exposure, Police, and Technologies*. Feng, H., L. Yu and W. Solecki (eds.), pp. 275-282. In press.
- Jones, K. W., D. Van Der Lelie, M. McGuigan, S. Tomov, A. J. Sedlacek III, **H. Feng**, et al. (2005). "Coping with contaminated sediments and soils in the urban environment." In *Urban Dimensions of Environmental Change - Science, Exposure, Police, and Technologies*. Feng, H., L. Yu and W. Solecki (eds.), pp. 283-294. In press.
- Cochran, J. K., D. J. Hirschberg and **H. Feng** (2005). "Reconstructing sediment chronologies in the Hudson River Estuary." In the *Hudson River Estuary*, Levinton J.S. and J.R. Waldman (eds.), pp. 65-78.
- Feng, H.**, K. W. Jones, S. Tomov, et al. (2005). "Internal structure of type-I deep-sea spherules by x-ray computed microtomography." *Meteoritics & Planetary Science*, 40:2, pp. 195-206.
- He, X., **H. Feng** and Z. Feng (2005). "3D imaging of soil microstructure using synchrotron x-ray computed microtomography." *Acta Pedologica Sinica*, 42:2, pp. 328-330.
- Jones, K. W., **H. Feng**, A. Lanzirrotti, and D. Mahajan (2005). "Mapping metal catalysts using synchrotron computed microtomography (CMT) and micro-X-ray fluorescence (mXRF)." *Topics in Catalysis*, 32:3-4, pp. 263-272.
- Feng, Z. D.** and W. G. Wang, et al. (2005). "Holocene climate changes in the Mongolian Plateau: Preliminary results." *Quaternary International*, 136, pp. 25-32.
- Feng, Z. D.** and H. B. Wang (2005). "Pedostratigraphy and carbonate accumulation in the S1 Pedocomplex across the Chinese Loess Plateau: Implications for climate interpretation." *Soil Science Society of American Journal*, 84, pp. 422-429.
- Feng Z. D.**, C. B. An and H. B. Wang (2005). "Holocene climatic and environmental changes in the arid and semiarid regions of China: A review." *The Holocene*, 16, pp. 1-12.
- Feng, Z. D.** and H. B. Wang (2005). "Geographic variations in particle size distribution of the last interglacial pedocomplex S1 across the Chinese Loess Plateau: Their chronological and climatic implications." *Catena*. In press.
- Li, C. B. and **Z. D. Feng** (2005). "Modeling surface runoff in a small watershed in the western part of the Chinese Loess Plateau." *International Geoscience and Remote Sensing Symposium*, V, pp. 3041-3045 (EI).
- Feng, Z. D.**, L. Y. Tang, H. B. Wang and Y.Z. Ma (2005). "Holocene vegetation variations and the associated environmental changes in the western part of the Chinese Loess Plateau." *Paleogeography Paleoclimatology Paleocology*. In press.
- Zhao, C. Y., Z. R. Nan, G.D. Chen and **Z. D. Feng** (2005). "Spatially distributed and resource variables-based modeling of the potential ecological conditions in the Qilian Mountains." *Ecological Modeling*. In press.
- Feng, Z.D.**, L. Y. Tang, Y.Z. Ma, et al. (2005). "Stratigraphic and pollen evidence for an extremely wet climate during the marine isotope stage 3 in the western part of the Chinese Loess Plateau." *Paleogeography Paleoclimatology Paleocology*. In press.
- Feng, Z.D.**, X.W. Zhai, W. G. Wang, et al. (2005). "Eolian climatic variations during the past 30,000 years in the northern Mongolian Plateau, as indicated by geophysical, geochemical and geobotanical proxy data." *Paleogeography Paleoclimatology Paleocology*. In press.
- Houghtaling, K. and **S. L. Kight** (2005). "Turn alternation in response to substrate vibration by terrestrial isopods, *Porcellio laevis* (Isopoda: Oniscidea)." *Entomological News*. In press.
- Castillo, M.E. and **S. L. Kight** (2005). "Response of terrestrial isopods, *Armadillidium vulgare* and *Porcellio laevis* (Isopoda: Oniscidea) to the ant *Tetramorium caespitum*: Morphology, behavior and reproductive success." *Invertebrate Reproduction and Development*. In press.
- Li, A.** (2005). "An Algebraic approach to building interpolating polynomials." *Discrete and Continuous Dynamical System*, Suppl. Vol., pp. 597-604.
- Li, A.** and S. Saydam (2005). "Linearity of polynomial models of discrete time series." *Proceeding of the IASTED Fifth International Conference on Modeling, Simulation, and Optimization*, pp. 125-128.

Passchier, S. and M. G. Kleinbans (2005). "Observations of sand waves, megaripples and hummocks in the Dutch coastal area and their relation to currents and combined flow conditions." *Journal of Geophysical Research*, pp. 110.

Prezant, R. S. (2005). "Can we save the urban river?" *Urban Dimensions of Environmental Change: Science, Exposures, Policies and Technologies*. In press.

Bieler, R., P. M. Mikkelsen and **R. S. Prezant** (2005). "Byssus-attachment by infaunal clams: Seagrass-nestling *Venerupis* in *Esperance Bay*, Western Australia (Bivalvia: Veneridae). *Proceedings of the Twelfth International Marine Biological Workshop: The Marine Flora and Fauna of Esperance*, Western Australia." In F.E. Wells, D.I. Walker and G.A. Kendrick (eds.) Western Australian Museum, Perth In press.

Prezant, R. S. (2006). Invited entries for *World Book Encyclopedia* on: Octopus, Jellyfish, Sea stars, Sea urchin.

Willis, S. with contributions from project team T. Keith-Lucas, J. Evans, K. Willis, H. B. Rollins, **R. S. Prezant** and D. H. Thomas (2005). *St. Catherine's Island Geographic Information System Pilot Project*. 42 pp.

Yu D. and C. Wu. "Incorporating remote sensing information in modeling house values: A regression tree approach." *Photogrammetric Engineering & Remote Sensing*. In press.

Presentations

Dr. Huan Feng, (Earth and Environmental Studies) presented an abstract of a poster, "Mapping temporal and spatial distribution of contaminants in Lower Passaic River sediments," co-authored with V. Onwueme, W. J. Jaslanek, E. A. Stern, K. W. Jones and K. Barrett at the Society of Environmental Toxicology and Chemistry (SETAC), North America 26th Annual Meeting, Baltimore, Maryland – November 13-17, 2005. He also delivered a co-authored paper with K. W. Jones and E. A. Stern titled "Characterization of sediments and other materials using synchrotron radiation" at the 32nd FACSS Annual Meeting in Quebec City, Canada on October 9-13, 2005, and presented "Morphology of methane hydrate host sediments" co-authored with K.W. Jones, et al. at the 229th ACS National Meeting on March 13-17, 2005, in San Diego, California.

Dr. Scott Kight (Biology & Molecular Biology) gave an invited presentation, "Arthropod parental care," as part of the Eastern Illinois University Biology Seminar and, as part of MSU's Human Sexuality Series, he presented "Sex, lies and parasites: What lessons about sexuality can be learned from other animals?" At the annual meetings of the Central States Entomological Society at the University of Kansas, Dr. Kight presented "Stress and

reproduction in terrestrial isopods (Isopoda: Oniscidea)."

In August, **Dr. Aihua Li** (Mathematical Sciences) gave an invited presentation, "Linearity of polynomial models of discrete time series," in the IASTED International Conference on Modeling, Simulation, and Optimization" held in Aruba. And in November, she received travel funding from MSRI to participate in the Morehouse College/Spelman College MSRI Workshop on Modern Mathematics held at Morehouse College and Spelman College.

Dean Robert S. Prezant presented "Predator induced responses in the viviparid *Bellamyia chinensis*" at the 2nd International Marine Bivalve Workshop in Chanthaburi, Thailand and "Temporal community structure and biodiversity of malacofauna from an urban New Jersey Pond" at the American Malacological Society, Monterey, CA. Both papers were co-authored with CSAM's Research Associate **Eric Chapman**.

On October 6, **Dr. Ken Wolff** (Mathematical Sciences) presented a session on "Problem solving that engages and enriches middle school students" at the Eastern Regional Conference of the National Council of Teachers of Mathematics in Hartford, Connecticut. Later that month, he presented a session on "Patterns, function and algebra with the figurative numbers" at the 18th Annual Conference of the Association of Mathematics Teachers of New Jersey in Somerset, NJ.

Dr. Danlin Yu (Earth and Environmental Studies) presented a co-authored paper, "Modeling spatial dimensions of housing prices in Milwaukee: GIS Based Approaches," at the 52nd North American Regional Science Association International (RSAI) Annual Conference, Nov. 9-12, Las Vegas, Nevada.

Kudos

Dr. Jordan Feng (Earth and Environmental Studies) is principal investigator of a \$380,000 NSF-ESH grant: Holocene Climatic Changes in the Mongolian Plateau, with Co-PIs: Dr. Kam-biu Liu at Louisiana State University, Dr. Prokopenko at U. South Carolina and **Dr. Stefanie Brachfeld** (Earth and Environmental Studies). He is also the PI for a pilot study of Kazakhstan Holocene and modern climate changes funded by a \$6000 MSU Proposal Development grant and is also Co-PI on a recently funded \$238,000 NSF Major Instrument project with **Dr. Brachfeld** (PI) and **Dr. Gorrington** and **Dr. Pope** as Co-PI.

In October 2005, **Dr. Mark Chopping** (Earth and Environmental Studies) was a participant in the 9th International Symposium on Physical Measurements and Signatures in Remote Sensing,

continued on next page

continued from page 10

hosted by Institute of Geographical Sciences and Natural Resources Research, Chinese Academy of Sciences, in Beijing, China. He also traveled to Inner Mongolia Normal University - Hohhot, Inner Mongolia Autonomous Region, where he gave a presentation to about 150 students, faculty, and researchers and held meetings with collaborators. Furthermore, he presented new results at the NASA MISR Science Team meeting, December 12-14, in Pasadena, CA.

Dr. Sandra Passchier (Earth and Environmental Studies) was invited to serve as a member of the Steering Committee of ACE (Antarctic Climate Evolution), one of the five Earth Science research programs within the Scientific Committee of Antarctic Research (SCAR). SCAR is an international organization supported by 28 countries that coordinates research in Antarctica and the Southern Ocean.

Staff Changes in Mathematical Sciences

The department of Mathematical Sciences welcomes Mr. George Grover as Department Administrator. His responsibilities include scheduling of all courses and instructors, book orders, and assisting Chairperson Roberts with departmental matters. Mr. Grover also serves as the Undergraduate Advisor/Coordinator. In this capacity his responsibilities include providing academic counseling to students regarding program requirements and academic standing, assigning majors to their faculty advisors, and evaluating transfer credentials and credit evaluation requests.

Mr. Grover was most recently a Graduate Assistant in the Department of Mathematical Sciences. He will complete the requirement for the MS in Mathematics, concentration in Pure and Applied Mathematics, within the year. Before that, Mr. Grover tutored high school mathematics and helped students prepare for the Quantitative & Verbal SAT test. He has his Provisional Certificate of Eligibility to teach mathematics in the high schools. Mr. Grover worked for many years for Prudential Insurance Company as Manager and, before that, as an Actuarial Associate. He has a B.A. in Statistics from Princeton University where he wrote his thesis on "Samples of Very Small Size from Long-Tailed Distributions."

Sister Janet McLaughlin Retires

Sister Janet began in 1989 as the coordinator of the Basic Skills MathLab. This marked the beginning of a new approach that enabled students to master basic topics in mathematics using a self-paced approach. Over the years, the

method of instruction evolved from a standard pencil approach to today's interactive, integrated computer tutorial method. Students are now more successfully completing the required material in a shorter time. Sister Janet was crucial in recommending and implementing the successful computerized approach. Under Sister Janet, working with graduate assistants who are available during class time to answer questions and provide instruction, the Basic Skills MathLab has grown from accommodating 159 students in Fall 1989 and Spring 1990 to 838 students in Fall 2004 and Spring 2005.

Sister Janet earned her BA in Mathematics from Montclair State University in 1955 and an MA in Mathematics from Boston College in 1972. She has had a varied career working as a mathematics chairperson and/or teacher in NJ schools, mathematics coordinator and teacher in EOF and Upward Bound programs at the College of Saint Elizabeth, Director of In-Jail Services, Post Release Services and Coordinator of Education Programs for the Morris County Jail, house manager of a Halfway House in Morristown, and resident manager of a low-income senior citizens apartment complex before coming to MSU.

Even though Sister Janet is retiring from Montclair she will work full time as the Administrative Assistant to the Non-Governmental Organization (NGO) representative of the sisters of Charity Federation to the United Nations. We wish her well in her new career.

The CSAM Newsletter is published semi-annually by the College of Science and Mathematics

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Jinan Jaber, Assistant Dean & Editor
Michael Kruege, Associate Dean
Raquel Peterson, Administrative Assistant
Tyra Addison, Secretary

It is distributed to MSU's administrators and CSAM's faculty, students and alumni. Back issues are available at www.csam.montclair.edu/events.

Send your comments and news to CSAM at addisont@mail.montclair.edu.

Calendar of Events

February 13, 2006

CSAM Science Professionals Speaker Series
Dr. Emlyn Koster, President and CEO
Liberty Science Center
6:30 p.m. – 7:30 p.m.
Sokol Seminar Room - (Science Hall)

February 23, 2006

CSAM Science Professionals Speaker Series
Dr. William Tansey, Cardiologist
Summit Medical Group
6:30 p.m. - 7:30 p.m.
Sokol Seminar Room - (Science Hall)

March 6, 2005

CSAM Science Professionals Speaker Series
Dr. Bradley T. Sheares, President
US Human Health Division, Merck & Co.
6:30 p.m. - 7:30 p.m.
Sokol Seminar Room - (Science Hall)

March 9, 2006

CSAM Seminar in Biology & Molecular Biology
Dr. Douglas Tallamy, University of Delaware
4:00 p.m. – 5:00 p.m.
Sokol Seminar Room - (Science Hall)

March 22, 2006

PharmFest
9:00 a.m. – 3:00 p.m.
University Hall

March 27, 2006

Math High School Day

March 30, 2006

CSAM Seminar in Chemistry & Biochemistry
“Biom mineralization: A Missing Link Between Biology and Geology”
Dr. H. Henry Teng, George Washington University
4:00 p.m. – 5:00 p.m.
Sokol Seminar Room - (Science Hall)

April 6, 2006

Margaret & Herman Sokol Science Lecture
Dr. Roald Hoffmann, Winner of 1981 Nobel Prize in Chemistry & 1990 Priestley Prize
“Chemistry’s Essential Tension: The Same and Not the Same”
8:00 p.m. - Alexander Kasser Theater

April 25, 2006

CSAM Science Professionals Speaker Series
Mr. Ronald Califre, Senior VP Operations
Novartis Pharmaceuticals Corporation
6:30 p.m. - 7:30 p.m.
Sokol Seminar Room - (Science Hall)

May 3, 2006

CSAM Science Professionals Speaker Series
Mr. Dennis Petrocelli, Senior VP
Matrix New World Engineering, Inc.
6:30 p.m. - 7:30 p.m.
Sokol Seminar Room - (Science Hall)

May 6, 2006

Sigma Xi Student Research Presentations
9:00 a.m. - noon
Sokol Seminar Room - (Science Hall)

May 15, 2006

CSAM Convocation
7:00 p.m. - Amphitheater

May 19, 2006

University Commencement
9:00 a.m. - Continental Arena

June 3, 2006

Family Science Day
sponsored by Professional
Resources in Science and Mathematics (PRISM)
9:00 a.m. 2:00 p.m - Student Center