NJSOC Director Thomas Named 2012 Lowell Thomas Awardee

Dr. William Thomas, Director of the NJSOC is one of the recipients of the 2012 prestigious Lowell Thomas Award presented by the Explorers Club. Established in 1980, the award is named for Lowell Jackson Thomas, an American writer, broadcaster, and traveler. The award honors outstanding achievements in the field of exploration and this year is centered on the theme “Exploring Extinction.” It is awarded periodically to those who have distinguished themselves in the field of exploration and who have made particular contributions in the specific area chosen to be that year’s focus. The achievements of each individual recipient contribute special distinction to the other recipients.

Dr. Thomas, anthropologist and conservationist, is dedicated to protecting biodiversity in Papua New Guinea by developing methodologies that bridge traditional knowledge and western science. He is particularly interested in the potential for indigenous knowledge to provide a blueprint for the conservation of the earth’s remaining wild lands.

Since 1988, Dr. Thomas has worked in remote regions of Papua New Guinea to record local environmental knowledge, helping to create a baseline of information on environments that have yet to be studied. UNESCO recognizes his work as a “Best Practice” on indigenous knowledge. His research has been funded by the National Geographic Society, Conservation International, the Indo-Pacific Conservation Alliance, The Explorers Club and the Porgera Joint Venture. In 2005, during an expedition in New Guinea’s Central Range – the largest, least explored wilderness on this island – he was part of an international team of scientists and local naturalists that discovered fifty new species.

Dr. Thomas hopes that by exposing conservationists to the potential of indigenous knowledge, they will be more willing to adopt local models of sustainability and involve local people in the conservation of their lands. He created the Papua Forest Stewards initiative to test his ideas and is currently working with several native communities to conserve their wilderness homelands. 

Founded in New York City in 1904, The Explorers Club is an international multidisciplinary professional society dedicated to the advancement of field research and the ideal that it is vital to preserve the instinct to explore. It promotes the scientific exploration of land, sea, air, and space by supporting research and education in the physical, natural and biological sciences. The Club’s members have been responsible
From Dean Prezant

The new academic year begins with remarkable recognition for CSAM’s NJ School of Conservation Director Bill Thomas. Being named a 2012 Lowell Thomas Awardee by the Explorers Club is no small feat and lands Dr. Thomas in stratospheric company. Dr. Thomas’ scholarship and conservation efforts in Papua, New Guinea deserve high praise and all CSAM congratulates and celebrates this wonderful achievement. CSAM is filled with productive and well recognized faculty and students representing all of our science and mathematics disciplines. Joining us this year are yet another six outstanding tenure track scholars, plus several outstanding Visiting Instructors, program assistants, educators, and post-doctoral research associates. We’re rereplete with dedicated faculty, staff and students, all pursuing active research programs, many residing in renovated laboratories and classrooms…but not all. And as you would predict with our remarkable growth comes a very serious “space crunch”. We are out of room!

This November you’ll see a bond issue on your ballot that would support capital improvements for our state’s institutions of higher learning. Approval of the bond translates into $750 million that can be used for construction of laboratories, classrooms and libraries. The eight public Colleges and Universities would be assured $247.5 million. For Montclair State University it would mean, with approval of our already submitted construction plans, ground breaking for our new Center for Environmental and Life Sciences (see page 4). We’re ready to go, shovel-in-the-ground ready! We’re ready to expand our bulging at the seams research programs in pharmaceutical chemistry (see below); our thriving research in environmental management (see pages 3, 5, 7, 9); and we’re ready to offer our students and faculty new facilities for their cutting edge research programs. It is critically important to our CSAM students that we have this new facility as soon as possible.

At this point, with less than a month to go, most citizens of New Jersey have still not heard that this ballot initiative is looming. We hope you’ll share this news and we are hoping you are ready to vote yes on the question of keeping New Jersey a major home for innovation, research, and discovery.

Drug Discovery for Neglected Diseases at MSU

In May of 2010, Dr. John Siekierka, Sokol Professor of Medicinal Chemistry and Director of the Sokol Institute of Pharmaceutical Life Sciences, along with the College of Science and Mathematics entered into a formal sponsored research agreement with the Celgene Corporation (Summit, NJ) and Dr. Jerome Zeldis, M.D., Ph.D., Chief Executive Officer, Celgene Global Health. Celgene Global Health (CGH) collaborates with partners around the globe to find solutions for healthcare challenges in the developing world. CGH, a division of Celgene Corporation, was founded in 2009 to focus on building collaborations with non-governmental organizations such as, Product Development Partnerships, academic institutions, public/private funding organizations, clinical research organizations and other pharmaceutical organizations to evaluate its deep and diverse library and pipeline of more than 400,000 compounds for activity in neglected diseases such as tuberculosis, malaria, leishmaniasis, trypanosomiasis, lymphatic filariasis and more.

This agreement allowed Dr. Siekierka’s laboratory to assess a collection of Celgene propriety kinase inhibitors for activity against novel parasitic protein kinases identified through Dr. Siekierka’s research. In January of 2012, this program advanced to a new level with a greatly expanded scope. Novel Celgene inhibitors are being used as lead structures that may become potentially new therapeutics for the treatment of human filariasis. Filariais is caused by a group of parasitic nematodes leading to diseases such as elephantiasis and river blindness which affect millions of individuals in endemic areas. The program, which exceeds over $270,000 in funding, enters into a new phase of inhibitor lead development. Dr. David Rotella, Sokol Professor of Chemistry joins this high-potential program and will be conducting medicinal chemistry initiatives to enhance the potency, selectivity and metabolic stability of the Celgene inhibitors identified to date. Dr. Rotella, with over 20 years experience in the field of medicinal chemistry, leads a team of chemists to design and to synthesize improved inhibitors which will be evaluated by Dr. Siekierka’s group for activity against filarial parasite protein kinases as well as against the parasites themselves. This exciting endeavor represents an early stage drug discovery program at an academic institution, a first for MSU.
Grant to Study Advanced Biofuel Markets

Growing concerns about energy security, uncertainty associated with costs and greenhouse gas emissions from fossil fuels such as petroleum, as well as the potential to provide socio-economic benefits in the form of additional income and new jobs, are fuelling the demand of renewable energy worldwide. A Joint Clean Energy Research and Development Center (JCERDC) was proposed between the Government of India and the US Department of Energy (DOE) to undertake collaborative research and development to advance clean energy technologies.

Three consortia—led in the U.S. by the University of Florida, the National Renewable Energy Laboratory and Lawrence Berkeley National Laboratory and in India by the Indian Institute of Chemical Technology, the Indian Institute of Science, and the Centre for Environmental Planning and Technology—were selected to leverage their expertise and resources in advanced biofuels, building efficiency, and solar technology, respectively. Montclair State University is part of the University of Florida led consortium that focuses on development of sustainable advanced lignocellulosic biofuel systems. With a $257,982 allocation from DE and a pledge of $265,768 cost-share, Montclair State University is entrusted with the task of conducting economic and environmental analyses of advanced biofuel markets. Dr. Pankaj Lal from the Department of Earth and Environmental Studies is Co-Project Director of the U.S. consortium. Along with his colleagues, he will develop a set of sustainability indicators for advanced biofuels in the U.S. The learning from site level analyses for feedstock production and conversion conducted by consortium members will be used to develop standards and protocols. Improvements in top emission contributing steps will be explored so as to identify better practices which can help in making the whole process of biofuel production more sustainable. Sensitivity analysis will be also undertaken to ascertain the impacts of different input parameters on the total emissions and energy consumption.

The comparative analyses for both countries are proposed so that researchers can adapt these standards and protocols according to feedstock, technology and country-specific socioeconomic milieu. The extent, to which existing standards and certification systems reflect these indicators, as well as how to make modified standards operational, will also be explored. In addition, Dr. Lal, along with his colleagues, will conduct life cycle analysis of lignocellulosic biomass. The carbon balance of advanced biofuel system will be ascertained and total emission of greenhouse gas from different feedstock management regimes will be evaluated through this analysis. The information thus gathered will be incorporated into a benefit-cost analysis to assess the profitability of different feedstock-based advanced biofuels. A techno-economic and capital budgeting model will be developed to estimate the unit cost and cost-competitiveness of advanced biofuels produced under different conversion systems.

Successful completion of the Center’s work will benefit both U.S. and India by delivering a working model for feedstock production and supply, biochemical conversion approaches and technologies that have been validated on pre-commercial scale systems, and overall economics and sustainability of biofuel production and supply systems. Drawing from the results of this research, the consortium will develop educational and outreach materials to enhance the capacities of stakeholders in both nations to produce and distribute second generation biofuel and biomass-based products. Once project solutions are implemented, they will contribute to both nations’ energy security goals such as achieving 21 billion gallons of second generation biofuels per year by 2022 in U.S. and, 20% blending of biofuels by 2017 in India.

Seminar Exchange

Over 100 faculty members, from top-tier colleges and universities around the world, comprise the College of Science and Mathematics. In an effort to advance the sharing of research, our research-active faculty make themselves available each year to speak on a broad range of research topics of interest to their counterparts at many of the area’s leading academic institutions.

This year’s roster consists of 63 faculty members from our five academic departments offering seminars in multiple disciplines on research conducted in important areas: Issues of Environment, Computational, Mathematical and Statistical Sciences, and Chemical Sciences and Life Sciences.


Additional topics, list of participating faculty and request information can be found at http://www.montclair.edu/csam/sep/seminar-topics/.

Montclair State University
**CELS — An Update**

As reported in the Spring 2012 edition of the CSAM Newsletter, the new site for our Center for Environmental Life Sciences (CELS) has been leveled and cleared in anticipation of the commencement of the construction of the new facility. Final building construction plans have been filed with the New Jersey Division of Codes and Standards (DCA). The DCA will review the plan in its entirety including electrical, plumbing, fire protection, energy usage, mechanical, elevator, ADA compliance, and lab equipment and safety. Upon receipt of a favorable decision, Montclair State University Office of Design and Construction will prepare the necessary documents for construction bids.

Funding of the construction remains a vital and an ongoing goal. Concerted efforts by Dean Prezant and Ms. Peggy Harris, MSU Development Officer, to reach out to friends of the College for support of this important endeavor continue. The proposed higher education bond issue (on this November’s election ballot) is the first in nearly a quarter century. The bond, if approved, will provide NJ public colleges the financial resources needed to construct and expand facilities essential to accommodate the growing need for new, modern and additional laboratory and research spaces so vital to the realization of CELS and the future of CSAM. Your support of this bond issue is of utmost importance. Make our collective voices heard this November!

**PharmFest 2102 — The Changing Landscape**

The Honorable Kim Guadagno, New Jersey Lt. Governor and Secretary of State Opened the 2102 PharmFest events — The Changing Landscape, held on April 3 at the University Conference Center. Mr. Dean J. Paranicas President & CEO, HealthCare Institute of New Jersey followed with welcoming remarks to the largest group of attendees since the inception of PharmFest in 2002.

The opening panel, Overcoming Today’s Pharma Challenge: Building on Past Successes with a Focus on Science, People and Partnerships, was moderated by Dr. Francis Cuss from Bristol-Myers Squibb with panelists from Merck, Venenum Biodesign and Bristol-Myers Squibb. At 10 a.m. two simultaneous sessions were offered: Start-up Enterprises and the Pharmaceutical Sector: Challenges and Innovations in Today’s Marketplace and The Convergence of the Biotech, Pharma, Medical Devices & Diagnostics Industries: Challenges and Opportunities.

The lunch keynote was delivered by Mr. Robert Hugin, (pictured right) Chairman and CEO of Celgene Corp. The 1 p.m. sessions consisted of New Trends in Pharmaceutical Sales and Market Research and Computational Drug Design followed by another consecutive sessions - Drilling Down: New Jersey’s Life Sciences Vendor Community and Small Molecule and Biologic Drug Discovery and Development. The day’s events concluded with a panel on Career Success in the Changing Pharma Industry for our students and alumni.

Thirty four top level scientists and business officers from the pharmaceutical and other related businesses volunteered their time and served on these panels. Companies represented included 3D-2 Drug, Nuclear Diagnostic Products, Scrip Intelligence, Medical Lab Diagnostics, KnowledgePoint360 Group, Novartis Pharmaceuticals, and Bristol-Myers Squibb among others.

PharmFest is a multipurpose daylong event designed to explore the pharmaceutical, health and medical technology industry and to broaden awareness of the current and future state of the industry. The event is hosted by Montclair State University in cooperation with the HealthCare Institute of New Jersey and the NJ pharmaceutical, health and medical technology industry. It is offered biennially by the collaborative work of the: College of Science and Mathematics (CSAM), School Of Business (SBUS), Center for Career Services and Cooperative Education (CCSCE) and HealthCare Institute of New Jersey (HINJ). For a full program and information on previous years’ events, visit http://www.montclair.edu/pharmfest/.

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CSAM Newsletter

**A Spectrum of Possibilities**

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**Montclair State University**

**Fall 2012**
PRI Names New Director

Associate Professor of Biology and Molecular Biology Meiying Wu has been appointed director of the University’s Passaic River Institute for Environmental Research and Education (PRI). The Institute, working in collaboration with federal, state, and local agencies, schools, and environmental advocacy groups, promotes environmental research and education and seeks solutions to environmental problems within the Passaic River Basin, its tributaries, and surrounding watershed lands.

The PRI conducts research in such areas as contaminant biological uptake, ecotoxicology, and ecosystem degradation and restoration. It develops scientific content for environmental education programs and regularly organizes academic and public conferences on topics relevant to the

Innovative Course in Bacteriophage Genomics Offered Again

by Sandra Adams, Department of Biology and Molecular Biology

The Department of Biology and Molecular Biology is again offering freshman students an innovative program in bacteriophage genomics research funded by the Howard Hughes Medical Institute (HHMI). The courses will be team-taught by Drs. Sandra Adams, Kirsten Monsen-Collar and Quinn Vega. HHMI Science Education Alliance (SEA) gives undergraduate students at select colleges and universities across the nation the opportunity to do hands-on original research studying bacteriophages (viruses that infect bacteria).

Montclair State University is one of 11 schools in the country selected for full membership in the program in 2011, and the only school in the state of New Jersey to be selected. HHMI provides training for faculty, laboratory supplies and materials, travel to HHMI Symposia, as well as support from HHMI staff.

The bacteriophage genomics program is offered in two semesters: laboratory sections of Principles of Biology I (BIOL 112) in the fall and Principles of Biology II (BIOL 113) course in the spring. During the fall semester, students will isolate phage collected from local soil samples, purify their phage, extract DNA, use restriction enzymes to characterize it, and prepare the phage for electron microscopy. Additionally, students name the phage for inclusion in a national database, Phagesdb.org. The purified DNA from one phage will then be sent for sequencing to a partner institution.

During the spring semester, students will receive digital files from HHMI containing the selected phage's genome sequence. The students will then use bioinformatics tools to annotate the phage. This culminates in a GenBank submission. The coursework builds on themes and techniques from across biology: microbiology, molecular biology, ecology, electron microscopy, and bioinformatics.

We were very successful during our first year and isolated seven novel bacteriophage, one of which was completely sequenced, annotated, and submitted to GenBank with 14 students as co-authors. ♦
The Red Hawk Mathematics Learning Center (RHMLC), opened January 2012 in the newly renovated Schmit Hall. The spring was a pilot semester. Students were enrolled in five undergraduate mathematics courses with a combined total enrollment of 526 students in Math 100 - Intermediate Algebra and Math 106 - Contemporary Applied Mathematics. Coming off very successful pilot semesters in Spring and Summer 2012, the RHMLC has opened its doors to over 1800 students this semester.

During Summer 2012, the staff began curriculum development and gearing up to receive students from all sections of Math 061 - Basic Skills Math, 100 - Intermediate Algebra, 103 - the Development of Math, 109 - Statistics and 114 - Math Business II - Calculus for the Fall semester. This will be the first semester where the RHMLC will be at capacity from morning till night and it promises to be an exciting time!

To accommodate the increased enrollment, in August we were fortunate to have two new Course Coordinators join the staff of the RHMLC. Some of you may recognize Timothy Mink, who is near completion of his Master’s in Pure and Applied Mathematics under Jon Cutler’s advisement. Tim earned his BS in Mathematics from Stevens Institute of Technology. Despite his late start to the position on August 13, Tim has done an outstanding job in organizing curriculum in a new text for Math 061 students.

Gregory Stock joins us out of Rutgers University, where he is just completing his Masters in Statistics (October 2012). Greg also earned a Master in Mathematics from Stevens Institute of Technology. Recently Greg has been an adjunct instructor at Rutgers, as well as Brookdale and Middlesex Community Colleges. During the upcoming semester, Greg will be working as a Part Time Course Coordinator and is managing the Math 109 curriculum. Since August 20, Greg has been putting in more than the expected hours in the RHMLC to pull together resources and organize the curriculum for our Math 109 students. He is doing excellent work! Greg, Tim, and I will be joined by eight graduate assistants and several undergraduate and graduate tutors to assist students taking their classes at the RHMLC.

The RHMLC is also undergoing a renovation and a much needed expansion! An important feature of our emporium design is the “Focus Group Session.” During this time, students leave the computer station and attend a small group session lead by either a Coordinator or Graduate Assistant. Students will be able to communicate more spontaneously with the instructor, graduate assistant, or each other. We will be able to highlight important topics as well as difficult concepts and application problems. With the renovations that are soon to be complete, this Focus Group session will now be able to be held in a classroom space right in the RHMLC. Additionally, we are adding more computers to the center and a drop-in room to allow students time to stay late, come earlier or just drop by if they want to get additional work done with the support of the staff.

In the Spring 2012 term, Drs. Corey Webel and Erin Krupa of the Department of Mathematical Sciences began a research study on the effectiveness of the courses in the RHMLC, highlighting students ability to problem solve in Math 100. This study will continue into the Fall semester. More information and results to follow.

On Saturday, October 6, 2012, the RHMLC will host the Garden State Redesign Conference. I would like to invite anyone interested in learning more about what is going on in mathematics course redesign projects in the state and some schools nationally to attend. Additionally, the Center will host an Alumni reception on Homecoming weekend, Saturday, October 13, 2012.

As always please feel free to stop by to see students engaging in their course work at the Red Hawk Mathematics Learning Center.
For the past seven summers, Newark middle school students and Passaic River Institute counselors have waded in streams and lakes, observed aquatic and woodland wildlife, measured water flow and quality, and seen firsthand what can happen to a major river’s watershed through environmental neglect — and subsequent remediation and preservation. Their interactive environmental education experience was made possible by donors to the Passaic River Institute’s Passaic Basin Eco-Explorers Summer Program in Environmental Science, Ecology, and Computer Technology.

The three two-week, all-day sessions camp provides a hands-on experience that introduces the concepts and tools of science, fosters respect for the environment, and encourages careers in science for the student participants. Topics studied include watershed protection, water treatment and analysis, water sampling, industry-river relationships, groundwater and tidal hydrology, estuarine ecology, ecosystem management, and related computer technology. Participants visit and study areas from the headwaters of the Passaic River to its mouth at Newark Bay. They typically spend the morning of each day in the field gaining hands-on experience in ecology and environmental science. The afternoons are spent in a computer laboratory at Montclair State learning how to document and present what they have experienced.

This summer, all of the camp’s donors were able to see their generosity in action, including eight representatives from The Landsberger Foundation, The Victoria Foundation, Covanta Essex Energy, Investors Bank and TD Bank, all of whom received a plaque, t-shirt, backpack, a potted shrub — and the sincere thanks of the students and their counselors. One group of funders came to the Essex County Environmental Center in Roseland to see the students take part in the hands-on “Uncover and Discover” program that showed them the array of wildlife and plants living adjacent to the river. Others guests put on waders to observe the students learning how to measure water flow and pollution levels in tributary streams at the Alfonso Bonsal Wildlife Preserve in Clifton.

The PRI Eco-Explorers Summer Program and the College of Science and Mathematics express their gratitude to the following contributors who made the 2012 program possible:

- The Landsberger Foundation $15,000
- Victoria Foundation $12,500
- TD Charitable Foundation $10,000
- Covanta Essex Company $5,000
- Investors Savings Bank Charitable Foundation $5,000

In keeping with the City of Water theme volunteers, Emily and Christian Olsen led activities for children on the skills of seamanship. For children 5 years and younger we had the "Sink or Float" using common household object. This proved to be a very popular activity and many parents played the game with their young children. A popular shipboard game, quoits tossing, made from coils of rope, was introduced.

School aged children were taught knots that are useful aboard boats. For older children we created very crude sextants from protractors and challenged them to determine the height of the new One World Trade Center building. We were very fortunate that at 1 pm we were able to take a noon sun sight. We were able to determine our latitude within a few degrees of our actual location.
**Invasive Plant Threatens Water Resources**

Professors Dirk Vanderklein, Biology and Molecular Biology, and Josh Galster, Earth and Environmental Studies, along with Geoscience B.S. students Marily Segura and Mariya Guzner, have been investigating the impact of Japanese knotweed on local water resources. This project continues the work of two previous graduate students and is supported by a Sokol Student-Faculty Research Grant.

Japanese knotweed is an invasive plant originally native to Asia but has been increasing its range steadily throughout the eastern United States. The plant, characterized by tall, dense stands typically grows next to rivers and with its extensive root system has the potential to transfer large amounts of water through transpiration.

The project has two parallel tracks that 1) measures the water usage of the plants and 2) maps the density and distribution of knotweed along local streams. Water usage has been measured at three sites from 5:30 AM to 8:00 PM that measured light intensity, photosynthesis, leaf water stress levels, and transpiration. These measurements will allow for the calculation of the liters of water used per square meter of knotweed.

The second track involves mapping the size of knotweed patches in the field using lasing range finders along local streams such as the Peckman, the Third River, and the Goffle. The measured areas of knotweed will be extrapolated to the watershed scale using a geographic information system (GIS) during the fall semester.

Combined, the two parts of the project will assess how much water these plants use from local water supplies. These supplies are projected to be stretched to their limits as human demand increases and the climate changes, so assessing the potential of this additional stress to the system is critical to protecting future water supplies.

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**Sixth Annual Student Research Symposium**

The University held its annual Student Research Symposium on April 22, 2012 at the University Conference Center. The Symposium showcases and rewards outstanding scholarship and research by MSU students. It also provides a venue for sharing research with the academic community, peers, and the greater community through oral, poster, or multimedia presentations. Open to undergraduate and graduate students, the Annual Montclair State University Student Research Symposium aims to promote interdisciplinary research and collaboration in the hope of instilling in our students the importance of exploring issues from multiple perspectives. A total of 141 students across all majors and degree programs presented oral papers and 194 students presented posters. They were mentored by over 107 faculty members.

For the second year, awards were presented to outstanding research and presentations. This year’s awardees were:

- **Undergraduate Student Award for Poster Presentation**
  Title: *Arabidopsis thaliana* pleiotropic drug resistance plays an important role in root development
  Presenter: Elizabeth Y. Flores, Co-author: Sang Won Han
  Advisor: Dr. Marcela Rojas Pierce

- **Graduate Student Award for Poster Presentation**
  Title: Montclair State students’ reflect on the impact of messages from school and home about sex on their first sexual experiences
  Presenter: Samantha Kwiatkowski
  Advisor: Eva Goldfarb

- **Undergraduate Award Oral Presentation**
  Title: Danthropology: A new interdisciplinary after-school project in structured play
  Presenter: Kelly Vaghanas
  Advisor: Dr. Neil Baldwin

- **Graduate Award Oral Presentation**
  Title: Towards a next generation green data center
  Presenter: Michael Pawlish
  Advisor: Dr. Aparna Varde

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Continued from page 1

for an illustrious series of famous firsts: First to the North Pole, first to the South Pole, first to the summit of Mount Everest, first to the deepest point in the ocean, first to the surface of the moon. Past Lowell Thomas awardees include Edmund Hillary, Isaac Asimov, Sylvia A. Earle, David Doubilet, Mary Cleave, Dan Rather, Rita R. Colwell, Jean-Michel Cousteau, Buzz Aldrin and Bertrand Piccard.

Dr. Thomas will be honored at the Explorers Club award dinner on October 13, 2012 at the Cedar Lake Event Space in New York City along with this year’s other awardees—Sir David Attenborough, David Hempleman-Adams, LVO, OBE, MD’00 and Scott Wallace FN ’07.

On March 7, 2012, I departed Punta Arenas, Chile, along with fellow CSAM student Nadine Orejola, (BS ’12) to participate in a six week LARsen Ice Shelf System Antarctica (LARISSA) research cruise off the east coast of the Antarctic Peninsula. It was an incredible opportunity to work alongside an international group of researchers, including marine geologists, geophysicists, physical oceanographers, biologists and glaciologists, who study atmosphere-ocean-cryosphere-biosphere interactions along the Antarctic Peninsula. This expedition was the second field program for this ongoing 5-year project. In 2010, EAES professor, LARISSA principle investigator and my advisor, Dr. Stefanie Brachfeld, joined the first LARISSA expedition to the western side of the Antarctic Peninsula.

The Antarctic Peninsula has undergone significant changes over the past half century, with seven of its twelve ice shelves having experienced retreat or collapse, coincident with a 2.5°C rise in air temperature. Two ice shelves from the eastern side of the peninsula, Larsen A (in 1995) and Larsen B (in 2002), experienced catastrophic disintegrations.

Working with LARISSA, we seek to understand the causes of ice shelf collapse and the response to the physical environment and the marine ecosystem after the ice shelves are removed. The Larsen Ice Shelf system can serve as a model of how the Antarctic continent may respond to the modern warming trend.

Sediment core samples were brought back to Montclair State University so that I, and other EAES students, can study in detail the magnetic and geochemical properties of the minerals present. These data, combined with records collected on the western Antarctic Peninsula in 2010, help reveal the paleoclimatic history of the region, including variations in westerly winds that carry warm air from lower latitudes to the poles and push warm water up against the Antarctic Ice Sheet and its fringing glaciers and ice shelves, ocean circulation, presence or absence of ice shelves, times of glacial advance, periods of high biological productive water, and historic sea ice extent.

The most common question I’m asked is what my favorite part of traveling to Antarctica was. There were a lot of amazing things—the penguins and wildlife, sunrises illuminating a sea full of icebergs, the glacially sculpted mountains, the excitement of recovering a great sediment core—but it was the experience of working in the field with such an incredible interdisciplinary science team that I value the most.

Women in Science Symposium

Celebrating 2012 Women History Month, the College of Science and Mathematics co-hosted (with the Women Center and Women and Gender Studies Department) the first symposium on women in science on Monday, March 5. The half day symposium titled “Beyond Barbie: Real Women in the World of Science”, consisted of Keynote address by Dr. Melda Yildiz, (pictured left). Dr. Yildiz, an Associate Professor, School for Global Education and Innovation, at Kean University, and co-Chair of NJ Women’s & Gender Studies Consortium On Women discussed “Math, Science, and Technology across Cultures throughout History: Global Media.” She was followed by a panel presentation on “Women in Science: Past and Present” and a panel on “STEM Careers for Women: Challenges, Mentorship and Balance.”
Convocation 2012

On a beautiful sunny Saturday afternoon of May 12, the College of Science and Mathematics held its annual Convocation ceremony at the University’s Sprague Field. Dr. Gene E. Likens, (pictured right), Distinguished Senior Scientist, Founding Director and President Emeritus of the Institute of Ecosystem Studies, received an Honorary Doctor of Science Degree. Associate Dean Jinan Jaber served as master of Ceremonies and remarks were made by President Susan A. Cole and Dean Robert S. Prezant.

Outstanding Students Awards were given to graduating seniors from each of CSAM’s academic majors. The selection is based on academic performance, involvement in research, service and leadership.

This year’s recipients were:

- Marco T. Finocchiaro, Aquatic and Coastal Sciences
- Gregory Parker, Biochemistry
- Pablo Salcedo, Biology
- Julian Velez, Chemistry
- Davor Risteski, Computer Science
- Jessica Lynn Centinaro, Geography
- Deepa Shah, Geoscience
- Antonio Cardellicchio, Information Technology
- Nicholas Kass, Mathematics
- Sung Choi, Molecular Biology
- Alexander Cali, Physics

Nicholas Kass was also named Outstanding Student conducting Undergraduate Research, and Deepa Shah represented the graduates as Student Speaker.

CSAM Annual Awards

CSAM held its annual awards ceremony on May 2, 2012. Graduate students, faculty and staff were recognized for their service, teaching and research. Congratulations to the following:

Outstanding Master’s Students
- Scott Buchanan, Biology
- Marni Crow, Molecular Biology
- Maryam Alapa, Chemistry
- Christopher Robert Bogda, Computer Science
- Casey M. Ezyske, Environmental Studies
- Carl Joseph Natter, Geoscience
- Kaveh Saminejad, Statistics
- James Alexander, Mathematics
- Sarah Lindsey Voss, Teaching Middle Grades Mathematics

Margaret and Herman Sokol Awards
- Faculty/Student Research Award
  - Clement Alo/Sean Rittinger
  - Eric Forgoston/Kristina Torbratt
  - Dirk Vanderklein and Joshua Galster/Mariya Guzner, Mariany Segura

Graduate Summer Student Research Fellowship
- Tanya Sulikowski, Biology & Molecular Biology
- Garrett Nieddu, Mathematical Sciences

Graduate Fellowship in Science
- Ryan Coogan, Mathematical Sciences

CSAM Awards of Excellence
- Graduating Senior – Nicolas Kass, mentor Eric Forgoston
- Graduating Masters – James Alexander, mentor Lora Billings
- Doctoral Research – Padmini Das, mentor Yang Deng
- Faculty Research Award – Johannes Schelvis
- Faculty Teaching Award – Eileen Fernandez
- Professional Staff – Jacalyn Giacalone Willis

Special Recognitions
- Mary Lou West, Retirement
- Ken Wolff, Retirement
- Outstanding Academic Advising – Jonathan Cutler
- Evan Maletsky Award – Melissa Tavarone

♦
SHIP student Katrina Bandeli received the First Place Award in the undergraduate poster competition at the 9th Garden State Undergraduate Math Conference held in March at Raritan Valley County College. Her research on “Sum Indices and Product Indices of Single Cyclohexane Chemical Compounds” is supervised by Dr. Aihua Li. Katrina also received a $500 travel fund from the Mathematics Association of America to attend the national meeting “MathFest” organized by Mathematics Association of America held in Madison, Wisconsin in August.

Four Center for Quantitative Obesity Research students, Yasmin Begum, Shanakey Cupidon, Yuna Maeda, and Mahzabin Tibbi, traveled to the Pennington Biomedical Research Center in Baton Rouge, LA in March to receive training on obtaining body composition measurements. They also toured the facility to observe how precise measurements through magnetic resonance imaging, dual energy X-ray absorptiometry, and indirect calorimetry are performed in the study of obesity. The team will be applying their training to measure body composition in the Montclair State University population.

The Mathematical Association of America (MAA) selected Leslie Cheteyan, Stewart Hengeveld and Michael Jones to receive one of the two annual $500 MAA’s 2012 George Pólya Award. This award is given for articles of expository excellence published in the The College Mathematics Journal.

Center for Quantitative Obesity Research student Shanakey Cupidon was accepted and participated in the highly competitive University of Medicine and Dentistry, New Jersey School of Osteopathic Medicine Summer Program. Shanakey is currently a fourth year biology major.

Nanzhu Li (PhD student in Environmental Management) and Casey Eyske (MA student in Environmental Studies), pictured below, under the supervision of Dr. Yang Deng gave two presentations, respectively, at the 27th International Conference on Solid Waste Technology and Management in Philadelphia, PA. Nanzhu’s oral presentation is entitled “Formation of disinfection by-products during chlorination of landfill leachate”, and Casey’s poster presentation is entitled “Fate of cerium oxide (CeO₂) nanoparticles in landfill leachate.”

Biology and Molecular Biology students Shivani N. Patel and Mary Salim (pictured below) attended the Howard Hughes Medical Institute (HHMI) 4th Annual SEA-Phages Symposium held at Janelia Farm Research Campus in Ashburn, VA. along with Dr. Sandra Adams, Department of Biology and Molecular Biology. They presented a poster of the results of MSU’s first Phage Genomics Research Initiative (PGRI) course. PGRI is funded by a grant from the HHMI Science Education Alliance (SEA).

Earth and Environmental Studies masters students Brendan Reilly and Deepa Shah presented their M.S. thesis research at the Scientific Committee on Antarctic Research (SCAR) Open Science Meeting in Portland, OR. Deepa also presented her work at the Northeast regional Geological Society of America conference in Hartford, CT.

Dr. Schelvis’ graduate student Kyle Williams and undergraduate student Ivana Prokopova of the Department of Chemistry and Biochemistry presented posters entitled ‘Spectroscopic study of the interaction of Escherichia coli photolyase with UV-damaged DNA’ and ‘Spectroscopic properties of 5, 10-ethylenetetrahydrofolic acid in solution’ at the 244th National Meeting of the American Chemical Society.

The College of Science and Mathematics congratulates the following faculty on their well deserved promotions effective September 2012:

Kirsten Monsen, Biology and Molecular Biology, to Associate Professor;

Hans Schelvis, Chemistry and Biochemistry, to Professor;

Nina Goodey, Chemistry and Biochemistry, to Associate Professor;

Stefan Robila, Computer Science, to Professor;

Joshua Galster, Earth and Environmental Studies, to Associate Professor;

Jonathan Cutler, Mathematical Sciences, to Associate Professor;

Baojun Song, Mathematical Sciences, to Associate Professor; and

Diana Thomas, Mathematical Sciences, to Professor.
CSAM Welcomes New Hires

Jasey Araque – Program Assistant, CSAM Dean’s office
B.S. Montclair State University

Rohit Bhat – Postdoctoral Associate, Department of Chemistry and Biochemistry
M.Pharm Manipal University, India
Ph.D. University of Mississippi

Tanya M. Blacic – Assistant Professor, Department of Earth and Environmental Studies
B.S., M.S., Ph.D. University of California, Davis

Thomas Card – Environmental Educator, NJ School of Conservation

Herman M. Dolezal – Visiting Assistant Professor, Department of Computer Science
B.S. Fordham University
M.S., MMS, Ph.D. Stevens Institute of Technology

Hendrik Eshuis – Assistant Professor, Department of Chemistry and Biochemistry
B.S., M.S. University of Utrecht (Netherlands)
Ph.D. University of Bristol (UK)

Marc Favata – Assistant Professor, Department of Mathematical Sciences
B.S. California Institute of Technology
M.S., Ph.D. Cornell University

Yvonne M. Gindt – Associate Professor, Department of Chemistry and Biochemistry
B.S. University of Wisconsin-Eau Claire
Ph.D. University of California at Berkeley

Steven Greenstein – Assistant Professor, Department of Mathematical Sciences
B.S. Georgia State University
M.S. Texas State University, San Marcos
Ph.D. University of Texas at Austin

Deborah L. Ives – Visiting Assistant Professor, Department of Mathematical Sciences
B.A., Kean University
M.A.T., Ed.D. Montclair State University

Eliza Leszczynski – Visiting Instructor, Department of Mathematical Sciences
B.S., M.S. Montclair State University

Robert Meredith – Assistant Professor, Department of Biology and Molecular Biology
B.S. Villanova University
M.S. South Dakota School of Mines & Technology
Ph.D. University of California Riverside

Ursula Wolz – Visiting Associate Professor, Department of Computer Science
B.S. Massachusetts Institute of Technology
M.A. Teachers College Columbia University
M.S., Ph.D. Columbia University

Wenwei Xiong – Post-doctoral Research Associate, Department of Biology and Molecular Biology
B.S. Tongji University
Ph.D. Tongji University

Tian Yao – Postdoctoral Research Associate, Department of Earth and Environmental Studies
B.S. Beijing Normal University
Ph.D. Boston University
Kudos

Dr. Stefanie Brachfeld (Earth and Environmental Studies) was named to the Review and Advisory Committee of the Institute for Rock Magnetism (IRM), University of Minnesota. The IRM is a National Science Foundation multi-user facility whose core mission is to serve the greater geomagnetic community by providing access to state-of-the-art facilities and technical expertise, pushing the frontiers of mineral magnetism, and developing connections to other disciplines.

Drs. Eric Forgoston and Lora Billings (Mathematical Sciences) have been awarded $278,966 from the NSF for their project entitled, "Understanding the Dynamics of Stochastic Disease Spread in Metapopulations."

Dr. Pankaj Lal (Earth and Environmental Studies) has been awarded the USDA Agriculture and Food Research Initiative competitive grant ($349,963) to study socioeconomic impacts of woody biofuels in thirteen Southern States in U.S. The three year grant titled “Assessing socioeconomic impacts of biofuel development on rural communities in the Southern United States” will be conducted with colleagues from Texas A&M University, Virginia Tech, and Tuskegee University. Dr. Lal is also co-PI of a team that secured five year $6.25 million competitive grant from Department of Energy. He will work with colleagues from University of Florida, University of Missouri, Virginia Tech, Texas A&M University, Show Me Energy, and Green Technologies to develop “US-India Consortium for Sustainable Advanced Biofuels System”. With grant share of $257,982, he will conduct economic and environmental analysis of advanced biofuel markets in the US. (see page 3).

Dr. Aihua Li (Mathematical Sciences) received $16,592 from the National Security Agency and $2000 from the National Science Foundation Regional Undergraduate Mathematics Conferences (NSF-RUMC) to host the Garden State Undergraduate Mathematics Conference 2013-2014. She was elected a 3-year term as a council member of the national organization: "Council on Undergraduate Research” (CUR) from June 2012 to May 2015.

Duke Ophori (Earth and Environmental Studies) received a grant of $5000 from the Global Change SysTem for Analysis, Research and Training (START) Program. The funds were used to host a visiting scientist, Dr. Mark Yidana, of the Department of Earth Sciences, University of Ghana.

Drs. Elena Petroff and Laying Wu are the recipients of a two-year $149,458 Sokol Faculty Award Fund grant to work on Electron and Fluorescence Microscopy for Imaging Structure and Function in Biological Systems.

Dr. Robert Prezant (CSAM Dean) has been appointed to the Hackensack University Medical Center, Mountainside, Board of Trustees.

Drs. Dibs Sarkar and Yang Deng (Earth and Environmental Studies), with their collaborators - Dr. Xingmao Ma at Southern Illinois University Carbondale and Dr. Rupali Datta at Michigan Tech, have been awarded $199,946 from the Office of Surface Mining (OSM) Reclamation & Enforcement, US Department of the Interior. The project is entitled "Low-cost, Green Technology to Improve Water Quality in Mining-Impacted Ecosystems, Phase I – Model Development and Optimization". The 2-year research activities aim at developing and optimizing two complementary, novel, “green”, cost-effective materials (a recycled industrial waste - drinking water treatment residuals (WTRs), and a perennial grass - vetiver) for passive treatment of acid mining drainage (AMD) and AMD-impacted water during surface mining. The representative AMD, AMD-impacted surface water, and acid sulfate soils in this study will be collected from the Tab-Simco coal mine site in Southern Illinois.

Drs. Vladislav Snitsarev and David Rotella are awarded $100,000 Sokol Faculty Award Fund grant to study the UPLC Chromatography System for Drug Discovery. This award is for $50,000 in FY 2013 and $50,000 in FY 2014.

Dr. Diana Thomas (Mathematical Sciences) research on exercise was covered in an August 1 article in the New York Times (http://well.blogs.nytimes.com/2012/08/01/dieting-vs-exercise-for-weight-loss/?ref=gretchenreynolds). The study, led by Dr. Thomas revealed that exercise does not “rev” your metabolism and that individuals who vigorously exercise tend to compensate by increasing their dietary intake. The study was additionally reported as front page story.yahoo.com/article?news=hahoo.com/news (http://shin.e.com/healthy-living/diet-exercise-better-losing-weight-164900774.html) and a more detailed description of the study appeared in Glamour (http://www.glamour.com/health-fitness/blogs/vitamin/g/2012/08/weight-loss-does-exercise-real.html). All coverage included links to the health based calculators programmed by Dr. Carl Bredlau, Professor Emeritus of Computer Science. Dr. Bredlau's calculators are currently being used in several ongoing weight related interventions and can be accessed at: http://www.pbrc.edu/research-and-faculty/calculators/.

Drs. Ashwin Vaidya, Phil Yecko, Arup Mukherjee and David Trubatch (Mathematical Sciences) have been awarded $171,135 from the NSF for their project entitled, "MRI: Acquisition of Imaging System for the Study of Flow Patterns."

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Publications


Madadran C.J., H.Y. Kim, G. Gao, Continued on page 15


Faculty Activity

Dr. G.E. Antoniou (Computer Science) presented "Realization of 2D Reverse-Lattice Discrete Filters," at the IEEE (Xplore) 5th International Symposium on Communications, Control, and Signal Processing (ISCCSP’2012).

As a part of his Global Education Center project, Dr. Yang Deng (Earth and Environmental Studies) visited Chongqing, China in May, 2012. In this trip, he delivered three presentations in Chongqing University, Appraisal Center of Environment and Engineering (CACEE), and Sanfeng-Covanta Environmental Industry Co., The titles of his talks were: “Water treatment residual and scrap tire as sorbents for heavy metals in urban runoff,” “Fate of nanomaterials in landfill leachate,” and “Chemical oxidation for treatment of landfill leachate” at Sanfeng-Covanta Environmental Industry Co., respectively.

Dr. Deng was invited to deliver an oral presentation “A Review on Advanced Oxidation Processes (AOPs) for treatment of landfill leachate” at the 27th International Conference on Solid Waste Technology and Management.

Dr. Lisa Hazard (Biology and Molecular Biology) presented “Do ecological factors drive physiological control of a unique ion-secreting tissue, the lizard salt gland?” and “Variation in salinity aversion of temperate forest amphibian species may influence response to anthropogenic salinization” co-authored with students K. Kwasek, E. Koelmel, M. Gonzalez-Abreu, and S. Gerges at the World Congress of Herpetology in Vancouver, B.C. At the same conference, she served as judge for the Graduate Awards.

Dr. Pankaj Lal (Earth and Environmental Studies) presented his paper “Modeling Bioenergy and Traditional Forest Markets Tradeoffs in the Southern United States” at the 2012 World Conference on Natural Resource Modeling held in Brisbane, Australia. He gave a second presentation at the Association of American Geographers 2012 Annual Meeting.

Dr. Aihua Li (Mathematical Sciences) organized the 9th Garden State Undergraduate Mathematics Conference held in Raritan Valley County College. About 150 students participated in the conference. She reviewed three articles for Mathematics Reviews and refereed one paper for the journal Primus. Dr. Li gave the following departmental colloquium presentations: “Randic and Sum Connectivity Indices of Certain Graphs” at Beijing Jiaotong University and "Zero Divisor Graphs of Upper Triangular Matrix Rings” at University of Louisiana at Lafayette. She delivered invited talks -“Potential Research Topics for Collaborations” at the Machine Learning and Information Security Workshop, Beijing Jiaotong University, “Solving Second Order Discrete Sturm-Liouville BVP Using Matrix Pencils”, joint with a former student Michael Wilson, at the International Conference on Applied Mathematics...

Continued on page 16
Upcoming Events

Saturday, October 6, 2012: Garden State Redesign Conference
Red Hawk Math Learning Center – Schmitt Hall

Friday, October 12, 2012: 2nd Annual Creative Research Center Symposium
11:00 a.m. Live Webcast – DuMont Broadcasting Center Studio
The Scientific Imagination: Where Do Ideas Come From?

Saturday, October 13, 2012: MSU Homecoming

Tuesday, October 16, 2012: Sokol Science Lecture
8:00p.m. – Kasser Theater
To Eat or Not to Eat: Leptin and the Biologic Basis of Obesity
Jeffrey Friedman, MD, PhD
Marilyn M. Simpson Professor and head of the Laboratory of Molecular Genetics at Rockefeller
Investigator at the Howard Hughes Medical Institute
2005 winner of the Gairdner Foundation International Award and the Passano Foundation Award
2009 winner of the Shaw Prize and Keio Medical Science Prize and 2010 winner of the Albert Lasker Award for Basic Medical Research (both with Douglas L. Coleman)

Friday, October 19, 2012: Passaic River Symposium V
8:00a.m. – University Hall Conference Center
Today’s Status, Tomorrow’s Perspective
http://www.montclair.edu/conferencecenter

CSAM introduces a new addition to its family of publications with the launch of CSAM Insights, a chronicle produced by CSAM’s research faculty and members of the Dean’s staff in an effort to broaden awareness and understanding of the scope and relevance of CSAM’s research initiatives as well as the critical role research plays in preparing the next generation of scientists. Take a look at the inaugural edition at montclair.edu/csam.

POSTDOCTORAL RESEARCHER

Yingkai Xu, (Chemistry and Biochemistry) presented a poster entitled “Assignment of the Vibrational Normal Modes of the Isotope-Labeled Riboflavin Neutral Radical in Riboflavin Binding Protein by Resonance Raman Spectroscopy and Computational Chemistry’ at the 244th National Meeting of the American Chemical Society. ♦

TOBB University of Economics and Technology, Ankara, Turkey in May and “Randić and Sum Connectivity Indices of Certain Trees” joint with a former student Jennifer Feiner, at Graph Theory Day 63 held at Passaic County College.

In February 2012, Dr. Sandra Passchier (Earth and Environmental Studies) gave invited talks at the MARM-Center for Marine Environmental Sciences, University of Bremen, Germany, and the Institute for Marine and Atmospheric research Utrecht, at Utrecht University. Dr. Passchier also accepted a 2-year term as a member of the Curatorial Advisory Board of the Polar Rock Repository at The Ohio State University.

Dr. Elena Petroff (Biology and Molecular Biology) delivered an invited talk on the effects of synthetic peptides on glial proliferation at the Experimental Biology annual meeting, a multidisciplinary scientific meeting comprised of nearly 14,000 scientists and exhibitors representing six sponsoring societies and 30 guest societies. Dr. Petroff mentored Dominic Brown, a Weston Scholar student who won the first prize at the New Jersey Academy of Sciences annual meeting for his presentation “Glial proliferation: The effect of ASIC channels and peptides” and was invited to present at the American Junior Academy of Sciences national meeting in Boston in February 2013. This is the second student from Dr. Petroff’s lab to achieve this honor.

Postdoctoral Researcher Yingkai Xu (Chemistry and Biochemistry) presented a poster entitled “Assignment of the Vibrational Normal Modes of the Isotope-Labeled Riboflavin Neutral Radical in Riboflavin Binding Protein by Resonance Raman Spectroscopy and Computational Chemistry’ at the 244th National Meeting of the American Chemical Society. ♦