

CSAM NEWSLETTER

College of Science and Mathematics

A Spectrum of Possibilities

MSU Receives \$8.25 Million Gift For CSAM

By Nancy Masterson-Newkirk, Office of Development and Robert S. Prezant, CSAM Dean

On Thursday, February 15, 2007, a historic moment at the University and within CSAM was celebrated as MSU Board of Trustees officially announced Margaret and Herman Sokol's posthumous donation of \$8.25 million to advance Montclair State's commitment to chemistry and biochemistry research and education. CSAM students and alumni who received Sokol support, current and former faculty, CSAM Advisory Board members and members of the pharmaceutical community gathered to celebrate the Sokols' extraordinarily generous final gift to Montclair State and witnessed the formal approval of the naming of an institute in their honor. This gift – the largest single gift in the University's history – is the capstone of a 70 year long relationship with the Sokols and the University.

When Margaret McCormack and Herman Sokol met as students at Montclair State Teachers College in the 1930s, they could not have imagined what a tremendous effect they would both have on the school over their lifetimes. Today their alma mater and its College of Science and Mathematics are fundamentally stronger because of their lifelong philanthropy and support.

They married shortly after graduation. Dr. Herman Sokol was a research chemist and industrialist who served as president of the Bristol-Myers Company from 1976 to 1981. Mrs. Sokol taught mathematics and

science in public schools.

For many years, the Sokols' generosity has been seen and felt throughout CSAM, from the Sokol Seminar Room in Science Hall to scholarships, fellowships, research awards, the Margaret and Herman Sokol Science Lecture Series and the University's first named chair in chemistry.

Sadly, Margaret '38 and Herman '37 have now passed away (she in June 2006 and he in 1985), but their generosity ensures that their good works will live on, benefiting generations of Montclair State students and faculty, and through them society as a whole. This \$8.25 million bequest from Dr. and Mrs. Sokol's estate will create endowed fellowships, professorships, and a faculty awards program for CSAM. Building on the primary interests of the Sokols and also on an emerging strength within the College and in honor of all they have done, the College will also now create the Margaret and Herman Sokol Institute for Pharmaceutical Life Sciences.

This seminal legacy gift will enable us to host future lectures, grant professorships and provide student research opportunities. Most importantly, this planned gift creates a permanent impact on the education of future generations of scientists. CSAM can now offer a wider variety of educational opportunities, better reach out to surrounding pharmaceutical industries, and create stronger bridges with those entities. Through

the creation of these bridges and an interdisciplinary approach to research, we will better prepare our students for careers in the life sciences.

The new Margaret and Herman Sokol Institute will create a unique environment to bring together faculty, undergraduate and graduate students, research associates, technicians, scientists from the pharmaceutical industry

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From Dean Prezant



There's a great deal of academic "chatter" about the U.S. losing its competitive edge in the sciences. The news media is replete with articles about the future of science, technology, engineering and mathematics being found not in the U.S. but in China and India. Right after 9/11 there was a decline in the number of students from other countries coming to the U.S. for their post-baccalaureate education. Indeed, the governments of many other countries are investing heavily in science and science education. In more recent years the number of U.S.-based foreign students has again risen but at the same time there is more competition for the international student from other countries such as Canada, Australia, and England. Throw issues of outsourcing into the mix and what is clear is that educational institutions,

at all levels, need to encourage a global perspective as they create opportunities and programs in a world that demands more and more education in a broadened field of emerging science disciplines.

So, where is CSAM in this international mix? In a previous issue of this Newsletter, I noted the remarkable international opportunities available to our students and the wide global research swath our faculty take. As our earth continues to "shrink" because of enhancements in communications, greater sharing of limited resources, and ease of travel, it is imperative that this generation of students takes on a global perspective and becomes comfortable with an internationalized mindset. CSAM is doing its part. From Antarctica to France, CSAM is making itself known across the planet. In this issue of the CSAM Newsletter you'll read about Chemistry Chair Dr. Jeff Toney's participation in the German

Academic Exchange Service that emphasized "Science in Germany."

Dr. Huan Feng, Earth and Environmental Studies, updates us on his recent travel to Tianjin, China, as part of a delegation sponsored by the US National Oceanic and Atmospheric Administration and the China State Oceanic Administration, to discuss research and program collaborations. Dr. Robert Taylor, Earth and Environmental Studies, traveled to Western Siberia to form links with universities in Omsk, Russia. Earth and Environmental Studies graduate student, Michael DaSilva, discusses his research venture to the Andes. And finally, students can learn about our upcoming course in marine ecology that will include a two week research effort in Thailand. Add to this mix established or developing programs and links in several other countries, and you'll see that global programs and global studies are a growing part of the CSAM Spectrum of Possibilities. ♦

Marine and Aquatic Ecology – Research Course in Thailand and NJ

Montclair State University has a formal articulation agreement with Burapha University in Thailand. This agreement promotes shared research and academic programs. This past year, faculty members from both institutions visited the other to pursue research in marine and aquatic biology. Now, the first shared course will be offered under this agreement. *Tropical and Temperate Marine and Aquatic Ecology* will be a 4-credit research-based course for juniors, seniors and graduate students with some background (either research or courses) in marine, aquatic or ecological studies. The course will team American and Thai students in an intensive research effort that will carry between similar habitats in both coastal Thailand and New Jersey. Students from the U.S. will travel with MSU Biology faculty to Thailand. After two weeks in Thailand, American and Thai students will together return to New Jersey to continue to explore and research marine and aquatic habitats. Student research teams will select and pursue a research agenda with the goal of producing a high quality manuscript to be submit-

ted for publication to a peer reviewed international journal.

Southern Thailand is home to extensive mangrove forests, coral reefs, mud flats, sea grass beds, and beautiful beaches. The course will bring the class to all of these habitats as we move along the Thailand coast. All room, board and ground transportation associated with the course in Thailand for MSU students will be covered by Burapha University. This means students need only pay for air travel, tuition and a laboratory fee (and of course for the multitude of souvenirs they'll want to purchase.) There will be time in Thailand for American students, and in New Jersey for Thai students, to explore and tour local sights. The course will run from May 21 through June 29, 2007, starting with one week preparation in New Jersey followed by two weeks in Thailand and then two weeks back in New Jersey. For Information Contact Dr. Robert Prezant at prezant@montclair.edu or Dr. Paul Bologna at bolognap@montclair.edu ♦

\$2.8 Million NSF Grant Awarded

Three faculty members in the Department of Mathematical Sciences have been awarded funding for a 5-year, \$2.8 million grant project that begins on March 1st of this year from the National Science Foundation. The project, titled “GK12 Fellows in the Middle: Partnerships of Inquiry and Interdisciplinary Middle School Science and Mathematics” matches CSAM graduate students (Fellows) with middle grade teachers in five local districts—Kearny, North Arlington, Rutherford, East Rutherford, and Lyndhurst. The project’s main goals are to enhance graduate students’ communication skills, to strengthen teachers’ content knowledge, and to improve science and mathematics achievement in the middle school.

Drs. Ken Wolff, Mika Munakata, and Mary Lou West are the PIs directing the project. It is expected to involve more than twenty CSAM faculty

members, at least six members of the CSAM professional staff and several other MSU faculty. Each year eight graduate students, together with their CSAM research advisors, will conduct research and share those research experiences with middle school teachers and students. Fellows and teachers will participate in training activities that promote inquiry- and standards-based teaching, especially as they relate to raising the achievement of students with Limited English Proficiency and Specific Learning Disabilities. Each week during the school year, the Fellows will spend two full days in a middle school classroom co-teaching courses with an experienced teacher. Other major project activities include designing and delivering curriculum units, preparing and participating in science and mathematics field experiences, leading a math/science day at MSU, and presenting cutting edge research results and methodologies to

groups of students. Fellows and teachers will also have opportunities to engage in research and educational endeavors at international institutions, further enhancing middle school students’ understanding of research.

Through this program Fellows will bring their content knowledge and research experiences to the classroom, enhancing instruction and piquing students’ interest in science and math. Project activities are expected to raise the achievement level of middle school students and develop a vested interest in the public education system in the graduate students. For each year of their participation in the project Fellows receive \$30,000 in stipends and \$10,500 for tuition and related expenses. Interested graduate students may contact wolffk, munakatam, or westm @mail.montclair.edu . ♦

iImagine - NSF REU Grant Received

The Department of Computer Science was awarded a \$260,000 grant by the National Science Foundation to organize and manage a Research Experience for Undergraduates (REU) site in imaging and computer vision during the summers of 2007, 2008 and 2009. The project is led by Dr. Stefan Robila with support of faculty with experience in the field such as Drs. George Antoniou, Angel Gutierrez, and John Peng.

Over the last decades, advances in instrument and sensor technology, microchip and high density storage design, high speed networks and high performance computing resulted in tremendous progress in the way digital image data are acquired, processed, stored and distributed. As a consequence, the usage of digital imagery has also expanded. The Montclair REU site (iImagine) will involve eight sophomore and junior level students in an eight-week intensive summer program to perform research and develop new computer applications for imaging and computer vision. The students will be immersed in an active environment that involves research and educational interactions as well as social activities. The site has the distinct

characteristic of being located within the greater New York City area, one of the largest metropolitan concentrations in the U.S. The project is supported by activities that take place at various Montclair units as well as renowned imaging companies and world class museums. The site’s objectives include encouraging and motivating undergraduate computing students to engage in research and follow through with research oriented careers and graduate studies, providing an enriching educational experience by exposing the students to non-classroom faculty-student interactions, academic-industry and multidisciplinary research interaction, increasing the number of women, minorities and students from institutions with limited research infrastructure, improving oral and written communication and knowledge dissemination skills.

The student cohorts will be formed of computing related majors that have appropriate background and/or interests in imaging and computer vision. An application process as well as more details on the projects are available at <http://pages.csam.montclair.edu/~robila/iImagine/> ♦

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and potentially postdoctoral fellows with shared interests in pharmaceutical and medicinal life sciences. The Sokol endowments will markedly contribute to the Institute's growth and will serve as "seed funding" to acquire additional external support. The Institute will be the first of its kind at Montclair State and will become a "Center of Excellence" in New Jersey.

As the Institute develops, a mutualism will be created between MSU, evolving entrepreneurial ventures, and the broader pharmaceutical industry. The Institute will offer prime educational opportunities and a platform for the

development of new curriculum in emerging fields. The Sokol Institute represents a critical and transformational moment for the College and the University and one that will attract strong positive state and regional interest.

The Sokols were deeply committed to enabling Montclair State to create future generations of scientists, scholars and science teachers. They represent the best of Montclair State's past and the promise of our future. Their exceedingly generous legacy gift will ensure that Montclair State remains in the forefront of higher education in New Jersey. ♦

Advisory Council – Member Profile

(Editor's note: The following is part of a series that began in the Spring 2006 issue of the CSAM Newsletter, which features a member of the CSAM Advisory Council.)

A longstanding member of the Conservancy, **Dr. Barbara Brummer** was hired as state director of the New Jersey Chapter in January of 2004.

Dr. Brummer began her professional career as a microbiologist at Paterson General Hospital, following her graduation in 1968 from MSU. She had worked at the hospital part time during her junior and senior years, while earning a B.A. in Biology/Chemistry/Physics. In 1971, she joined Airwick Industries, moving on to American Home Products in 1976, serving as Vice-President, Director of Research and Development. During

this time, Dr. Brummer earned an M.S. and a Ph.D. in Biological Sciences from New York University. Upon completion of her dual degrees, she took a position as Group Director, Product Development at The Mennen Company. In 2002, she retired from Johnson & Johnson after a successful 12 year career, where she served as General Manager, President of J&J Canada Inc., and, finally, as Worldwide Vice President of the Women's Health and Wellness Franchise.

Throughout her career, Dr. Brummer has maintained a passionate interest in conservation. For many years, she



taught a course in field biology at Montclair State University and has spent many hours seeking out natural areas and studying the flora and fauna of New Jersey. In addition to her longstanding membership with TNC, she

has also been active in other local conservation organizations, serving on the boards of the New Jersey Audubon Society and the Pocono Environmental Education Center. Soon after joining The Nature Conservancy, Dr. Brummer was appointed by the Commissioner of the New Jersey Department of Environmental Protection to the Endangered and Non-Game Species Advisory Committee. Her personal interests include jug band music. ♦

Former HHS Secretary Meets With CSAM Students

MSU students interested in health careers and health issues had an opportunity to meet with the Honorable Tommy G. Thompson, former U.S. Department of Health and Human Services Secretary and four-term Governor of Wisconsin. In an informal and wide ranging session, Secretary Thompson and the students discussed international health initiatives and problems, his role as Secretary of Health, and his possible presidential aspirations. Secretary Thompson was visiting New Jersey as part of his ongoing relationship with Medical Missions. ♦



DAAD Information Tour 2006

By Jeffrey H. Toney, Department of Chemistry & Biochemistry



Participants in front of RWTH

The German Academic Exchange Service (Deutscher Akademischer Austauschdienst - DAAD) and the Federal Ministry of Education and Research (Bundesministerium für

Bildung und Forschung – BMBF) hosted a unique information tour for chemists and biochemists during December 2006. The group consisted of 20 selected U.S. scientists – 19 from academia and one from industry (Ford Motor Corporation) and were led by Dr. Christian Schäfer from the DAAD.

The theme of the tour, “Science in Germany: New Developments in Higher Education, Interdisciplinary cooperation and industrial application,” summarizes the goals of the visit. Over a period of six days, we visited universities, independent research centers as well as industrial facilities throughout Germany. This included University of Bonn, Fraunhofer Institute and Rheinisch-Westfälische Technische Universität Aachen (RWTH), Research Centre Jülich, Henkel Corporation in Düsseldorf, Max Planck Institute for Chemistry in Mainz, University of Heidelberg and European Molecular Biology Laboratory (EMBL) and Ludwigshafen (BASF). I saw many examples of truly world class research.

A major topic of discussion was the “Bologna Process,” an ambitious effort to unify higher education in the European Union (EU). Prior to the implementation of this process, there were more than 70 different degree programs within the EU for an undergraduate student pursuing studies in chemistry! When the “Bologna Process” is completed, there will be standardized B.S., M.S. and Ph.D. degree offerings throughout the EU. This will necessitate radical change within German higher education. Interestingly, a common theme of the new degree programs within all of the universities is interdisciplinary research.

The DAAD has also instituted a new program for undergraduates interested in pursuing scientific research in Germany called “RISE”. Undergraduates are matched with a German Ph.D. student for the summer. Knowledge of German is not necessary as English is commonly spoken in the laboratories and in seminars. Laboratories participating in this exciting program are in both academia and in industry. Application details can be found at: www.daad.de/RISE.

The German Academic Exchange Service (DAAD) is a publicly-funded independent organization of higher education institutions in Germany and promotes cooperative international academic and scientific exchange for students and faculty. The DAAD has 14 international offices that provide information as well as financial support to over 50,000 highly-qualified students and faculty per year for international research and study. Interested students may contact Dr. Toney at toneyj@mail.montclair.edu. ♦

Feng Delegate to China

By Huan Feng, Department of Earth and Environmental Studies

The city of Tianjin is located approximately 115 km east of Beijing, capital of China. Under Chinese 11th Five-Year Plan, Tianjin will be the third economic development zone in the nation.

An American delegation, sponsored by the New Jersey Marine Sciences Consortium and its New Jersey Sea Grant College Program with co-sponsorship from US NOAA International Programs and Sea Grant International and China State Oceanic Administration and invited by Tianjin Oceanic Administration, visited Tianjin Oceanic Administration, Tianjin Marine Environmental



Feng (first row, 2nd from left) at the Tianjin Oceanic Administration

Monitoring and Forecasting Center, Tianjin University, Tianjin University of Science and Technology and Tianjin Port in China. The delegation, led by Dr. M. Weinstein, President & CEO of NJMSC and Director of NJSGCP, included Dr. J. Hameedi (NOAA), Professor A. MacDonald (Monmouth U.), Dr. S.M. Glenn (Rutgers U.), Dr. O. Schofield (Rutgers U.), Dr. Q. Guo (Rutgers U.)

and Dr. Feng.

Tianjin Oceanic Administration is a regional office of the

State Oceanic Administration was founded in 1964 and is a functional institution responsible for the management of the national marine affairs. Tianjin Marine Environmental Monitoring and Forecasting Center is engaged in collecting environmental data, monitoring health status of the ocean and forecasting any unexpected events. Tianjin University, established in 1895 with the name of "Peiyang," is the first educational institution of higher learning in China. Now, it is a national key university with 4,600 faculty and staff, and 24,000 students. It has 81 doctoral programs and 124 master programs. Tianjin University of Science and Technology, founded in 1958, is a comprehensive liberal arts, science and engineering university with 1,500 faculty and staff and 18,000 students. It has 11 doctoral programs, 39 master programs and 56 undergraduate majors. The Port of Tianjin is situated within the estuary of the Haihe River in western Bohai Bay. It is the largest man-made facility of its type in China.

During the week long visit, the delegation members discussed with Chinese colleagues future collaboration between the institutions of these two countries. ♦

Serendipity Strikes!

By Mark Chopping, Earth and Environmental Studies

Our project is based in the Department of Earth and Environmental Studies and includes co-investigators at NASA and the USDA. In 2006 we were joined in collaboration by Dr. Andrea Laliberte (USDA, ARS Jornada Experimental Range) and Dr. Gretchen Moisen (US Forest Service, Ogden, UT). We have been pursuing the use of geometric-optical (GO) canopy reflectance models to estimate shrub cover. These treat the surface as an assemblage of discrete objects of equal size, shape, and height evenly distributed over a plane background. In the summer of 2006 we discovered quite serendipitously that our simple GO model provides a means to map forest cover, mean canopy height, biomass, and understory density – parameters of mounting importance with the increasing incidence, duration, extent, and severity of wildfire in western forests. We use the GO model to exploit the information available from the NASA Multiangle Imaging SpectroRadiometer (MISR) flown on the Terra satellite that views the surface at nine different angles. To our knowledge this is a first in the moderate (250 m) resolution remote sensing

world. These results have been quantitatively assessed against 547 random samples of mapped USFS Forest Inventory Analysis data and have accuracies (R^2) values of 0.76 (biomass), 0.58 (cover) and 0.53 (mean canopy height). Three students – Naushad Kollikkathara, N. Neeti, and Libertad Urena – were engaged to help prepare detailed maps of woody plants using high resolution (< 1 meter) imagery from the GeoEye Ikonos commercial Earth Observation Satellite. Our results have been presented at the NASA Land-Cover and Land-Use Change Science Team Meeting, the 2006 International Geoscience and Remote Sensing Symposium, the Committee on Earth Observing Satellites 3rd Global Vegetation Workshop, the NASA Carbon Cycle and Ecosystems Workshop, and the NASA MISR Science Team meeting and Data Users' Symposium, Pasadena, CA. They have also been reported in journals and a book chapter. ♦

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EAES in Russia

Dr. Robert W. Taylor, Professor of Urban and Environmental Studies in the Department of Earth & Environmental Studies traveled to Western Siberia last May as part of a Global Education Grant to develop collaborations with a consortium of universities in Omsk, Russia. His sponsor and host was the Omsk Institute of the Russian State University in Omsk where, after a week of steady conferences and presentations on his part, he was able to establish the outlines for a joint venture certificate program between Montclair State University and the Omsk Institute.

This certificate program consists of a group of modules on sustainable development with particular emphasis on corporate sustainability and the geographic dimensions of

regional smart growth. This program is being conceived as a professional certificate program which is non-credit



Taylor (second from left) with hosts from Omsk

bearing and is part of the Center for Environmental Management's (CEMA) approach to provide professional training experiences for a global educational market. ♦

Research in Patagonia

By Michael DaSilva

On December 29, 2006 at 10:40 pm, Dr. Matt Gorrington and I left JFK airport for our journey to the remote sparseness of Patagonia to continue our research on volcanism in the Andes Mountains of southern Argentina. This Patagonian research project was introduced to me as an undergraduate here at MSU, through my now thesis advisor, Dr. Gorrington of EAES. Now, as a graduate student, my research involves analyzing the chemical compositions of volcanic rocks in relation to the unique tectonic setting found in South America. Since becoming introduced to this complicated research project, Patagonia has exerted a powerful impact on me. As a geologist, this is an opportunity to pioneer a study and map an area that has never been previously addressed. As an individual, Patagonia instilled in me a new passion for the work that I do, as I take my academic career to a higher level.

We crossed the equator at 1:35 a.m. and landed in Buenos Aires, Argentina at 6:10 a.m. where the reality of this life-altering experience began to set in. After another short flight, we arrived in Comodoro Rivadavia, a small coastal city in southern Argentina. This is where we would begin the ~600-kilometer journey across the country to my field site to study the unknown Zeballos volcanic complex. Because of its remoteness, the Zeballos Complex has been a mystery to many. I am privileged to be one of the few to ever study it. After spending New Year's Eve in Comodoro, we drove our diesel-powered 4x4 west across the dusty gravel roads of the desolate Patagonian landscape. Along the way, we drove through



several villages where roads were long and straight, lined with endless estancia fences. We spent a few nights at Estancia Telken, where we witnessed firsthand the way of life of the Argentinian cowboys known as gauchos.

To my surprise, Patagonia was more beautiful and wild than I ever imagined. Below the infinite sky the rugged landscape is vast and diverse. Besides geography of the region, the landscape comes alive with color. Nearby Estancia Telken is Lago Buenos Aires, the second largest fresh water lake in South America. Its crystal clear water mirrors the hue of the sky above. The desert varnished basalts create a stark contrast to the white glacier-snow. Patagonia's breathtaking beauty is polarized by its ferocity. While its sights elevated me, its weather and rugged terrain humbled me. My experience in mountaineering helped me confront the inclement weather and challenging terrain ahead as I commenced my studies there. We experienced unpredictable weather conditions, commonly going from bad to worse. The gale-force wind was our shadow, often forced to retreat from a day's worth of work by torrents of hail and sleet. We spent many nights camping in the moon-like topography at high elevations. The same skies that brought us bone-chilling weather also brought us awe-inspiring sunsets. Its remoteness is further emphasized by the sound of merely the gusting wind and the oc-

casional sightings of guanacos and condors. It was an experience like no other.

The three-million year old Zeballos Complex is nestled in the foothills of the Andes Mountains on the border of Argentina and Chile. We spent nearly a week trekking through the complex, mapping and sampling lava flows and other volcanic units. I would later analyze these rock samples within the geochemical laboratories at MSU utilizing instruments such as the ICP-OES and ICP-MS. The analyses of these samples allow us to determine what processes were occurring before and during their eruption. In this region of South America, there are three tectonic plates interacting with each other where Nazca Plate is being completely subducted under the South American plate and the Antarctic Plate is diverging from this subduction zone. Therefore, the study of these volcanic rocks allows us to see

into the interior of the earth and model the production of magma within this complicated tectonic setting. I have presented preliminary research results at an international geological confer-



DaSilva (left) and Gorrington in the Andes

ence in Mendoza, Argentina and will be presenting at the Northeast Geological Society of America conference in Durham, NH this coming spring.

My research has been supported by EAES Departmental grants, the Geological Society of America (GSA), and most importantly the Margaret and Herman Sokol International Research Award which covered the ex-

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Research Opportunities for Commuter Students (ROCS)

By Diana Thomas, Department of Mathematical Sciences

CSAM's Research Opportunities for Commuter Students (ROCS) was established in 2003 to encourage and enhance undergraduate mathematics students' research, publication and presentations skills and experiences. During the summer and fall of 2006, seven undergraduate students were mentored by faculty of the Department of Mathematical Sciences. Each student prepared a technical report and poster presentation on a topic mentored by a ROCS faculty advisor. Participants included:

-Dimitriadis Alexandros, Comparison of Numerical Methods for Partial Differential Equations – Dr. Phil Yecko, advisor.

-Amir Golnabi, Numerical methods for solving partial differential



(l-r) Thomas and Shernce



(l-r) Mukherjee, Karabulut and Yecko

equations using MATLAB –

Dr. Bogdan Nita, advisor.

-Carmine Cantalupo, Probabilities in Nim Games – Dr. Michael Jones, advisor.

-Cihan Karabulut, Theory and Simulation of Fluid Flow Equations – Drs. Arup Mukherjee and Phil Yecko, advisors.

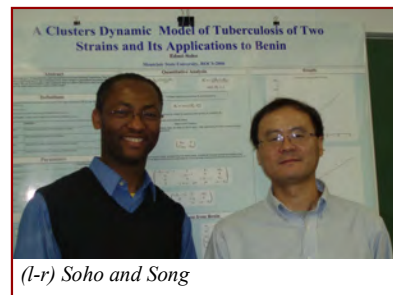
-Susan Shernce, Predicting Birth Weights through a Fetal Energy Balance Equation – Dr. Diana Thomas, advisor.

-Edme Soho, A Mathematical Tuberculosis Model – Dr. Baojun Song, advisor.

-Michael Wilson, Linear Models of

Certain Discrete Time Series – Dr. Aihua Li, advisor.

ROCS students, Amir Golnabi and Susan Shernce, are also participating in the Undergraduate Research Poster Competition sponsored by the Mathematical Association of America. For each of the past three years, a ROCS student has been a prize winner at this national competition. Past ROCS students have conducted interdisciplinary projects with mentors from other sciences. Students from all disciplines are encouraged to apply for ROCS by contacting Diana Thomas at thomas-dia@mail.montclair.edu. ♦



(l-r) Soho and Song

Sokol Awards Available

Through the generous support of the late Margaret and Herman Sokol, the following two opportunities are available to CSAM students:

Graduate Summer Research Fellowship, a \$5,000.00 stipend to a talented M.S. or M.A. graduate student to conduct research on their thesis at MSU during the summer of 2007, is available to any CSAM science graduate student who has completed one year of graduate study, is working on a research thesis, and will return to MSU for the fall 2007 semester. The stipend is meant to assist the student during the summer and help her or him to make significant progress on a thesis research project and eliminate the need for working full time outside of the university.

Graduate Fellowship in Science, a \$10,000 award to a graduating senior from Biology, Molecular Biology, Geoscience, Physics, Chemistry or Biochemistry who will pursue formal, full-time graduate study leading to a doctoral

(Ph.D.) degree at an accredited institution of higher learning.

Further information, application and deadlines are available at <http://pages.csam.montclair.edu> ♦

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penses of the trip this January.

Through this article, I was given an opportunity to introduce Patagonia as a mysterious and majestic region that is far more than the popular clothing company. It is a melting pot of culture and landscape with one of the world's most unique geologic settings. I feel enlightened both academically and culturally from this experience and would like to thank everyone supporting my research. ♦

Student Advisory Council Formed

To determine the needs of our students, The College of Science and Mathematics has formed a Student Advisory Council.

It is composed of a group of five undergraduate and five graduate students, equally representing the five departments of the CSAM-Biology & Molecular Biology, Chemistry & Biochemistry, Computer Science, Earth & Environmental Studies and Mathematical Sciences. The Council works directly with the Office of the Dean. One of its main objectives is to improve the College and enhance the CSAM student experience.

According to Dean Prezant, the Council "is designed to allow full discussion of issues of concern to our College and seeks combined input and recommendations to help advance and improve our academic home."

Currently, the Council representatives are:

Tracy K. Abar is a second year graduate assistant in mathematics and will be graduating May 07. She holds an undergraduate degree in business from NYU and a Master's in Physical Education & Sport also from NYU where she was Track & Field coach. Tracy has two children, Dylan and Jamie, ages 9 and 8, respectively.

Nekia Brice is an international student from Jamaica. She is completing her senior year as a Computer Science major.

Cathleen Dale is a senior majoring in biology with a concentration in environmental science and biology education, and minoring in geoscience and

chemistry. Her interests include marine ecology, marine geology, and environmental outreach. She is also involved in research projects where she has performed studies in St. John, USVI and spent a month aboard a research vessel in Antarctica with Dr. Brachfeld.

Mike DaSilva is a graduate student and teaching assistant in the department of Earth and Environmental Studies. He is completing his thesis work on the chemical compositions of volcanic rocks of Patagonia.



Yosef M Hamdeh is a junior majoring in Biology with Psychology and Chemistry minors. He has been an active member of MSU's EMT for three years and currently holds the rank of 3rd lieutenant. Yosef hopes to pursue medical education after completing his studies at MSU.

Vieroslava Gurunian is currently a graduate student in Chemistry. After completing her bachelor's degree in May 2006, she secured a research position at Sanofi-Aventis in Bridgewater, NJ.

Minas T. Kousoulis is a graduate student in Computer Science. He is analyzing images with a computer and developing algorithms to extract in-

formation from the image which is not apparent to the human eye. He expects to complete the degree requirements in May 2007.

Cailin O'Connor is a graduate biology major and teaching assistant for the biology department. She has worked as a wild bird rehabilitator and avian field researcher for five years and plans a career in ornithology.

Rojita Sharma is originally from Nepal. She is currently in her fourth year majoring in Biochemistry. Her research interest includes study of medicinal properties of natural products and she spent five weeks in (summer 2006) Dominican Republic performing ethnobotanical and ethnomedicinal studies. She plans on pursuing a doctoral degree in biological chemistry.

Michael K. Wilson is a junior from East Orange Campus High School. He now resides in Hillside, NJ. Michael is majoring in math and plans on teaching math at the high school level. He says that he has "come to realize that Math is like love; a simple idea, but it can get complicated~"

The Council strives to be the voice of all students enrolled in CSAM and as such welcomes any and all comments on issues that need to be addressed and assures that all matters brought forward will be scrutinized for a resolution as quickly and satisfactorily as possible. Comments and suggestions may be sent to csamadvisory@gmail.com or by dropping a note in the suggestion box located in front of Richardson Room 262. Students are also encouraged to visit the Council's website at www.csamSAC.org ♦

Spring Sokol Lecture

The Margaret and Herman Sokol Science Lecture Series will feature its tenth speaker, Dr. Robert Hazen on Thursday, March 29, 2007.

Dr. Hazen is Clarence J. Robinson Professor of Earth Science at George Mason University. Working with a team of scientists at the Carnegie Institution, he developed a successful proposal to join NASA's Astrobiology Institute to study the physical and chemical environments of high-pressure hydrothermal systems, and their possible role in pre-biotic organic synthesis and the origin of life. Recent research projects include studies of mineral-mediated organic synthesis, the role of minerals in stabilizing organic compounds at extreme conditions, and the chiral selectivity of enantiomeric mineral surfaces. He is also active in the development of microanalytical tools for paleontology. Hazen also developed a two-semester graduate seminar "The Literature of Astrobiology" for George Mason's astrobiology program.



In 1990 Hazen, with Robinson Professor of Physics James Trefil, wrote *Science Matters: Achieving Scientific Literacy* (Doubleday, 1991), which has almost 200,000 copies in print in a dozen languages. That volume proposes a definition of scientific literacy based on overarching scientific principles. Since 1994, Hazen has authored *The New Alchemists: Breaking Through the Frontiers of High-Pressure Research* and *The Diamond Makers* which explores the history of diamond making and other high-pressure applications, *Why Aren't Black Holes Black: Unanswered Questions at the Frontiers of Science* (written with Maxine Singer), adopting the style of *Science Matters*, but focusing on the overarching questions that drive today's science.

Dr. Hazen has appeared on NBC's *The Today Show*, CBS's *Nightwatch*, WGBH (Boston) *NOVA* and numerous other national and local TV and radio programs. He has also contributed articles and editorials to *Newsweek*, *The New York Times Magazine*, *Chronicle of Higher Education*, *The Scientist*, and other periodicals. Hazen and Trefil have also written three undergraduate textbooks: *The Sciences: An Integrated Approach*, *The Physical Sciences*, and *Physics Matters*.

Dr. Hazen is also an accomplished musician and has played symphonic trumpet professionally since 1966; performing and recording with numerous ensembles and appeared as soloist with the Boston Symphony Esplanade Orchestra, National Philharmonic, for which he is also a Board Member.

In 1987 he and his wife, Margaret, completed *The Music Men: An Illustrated History of Brass Bands in America*, which received the 1989 ASCAP Deems Taylor Award. They subsequently wrote the script and appeared in a documentary film on the history of bands, produced by SIRS Inc. *The Breakthrough: The Race for the Superconductor*, is a non-technical account of the discovery of high-temperature superconductivity. The Hazens also wrote *Keepers of the Flame*, a cultural and technological history of fire in early America.

His lecture, scheduled for 8 p.m. in the Kasser Theater, will be based on his latest book, *Genesis: The Scientific Quest for Life's Origins* published in 2005, which describes life's origins as a sequence of chemical steps, each of increasing complexity. Tickets, available at the Theater Box Office, are free to the MSU community and \$10.00 for others.

At 4:20 p.m., Dr. Hazen will hold a pre-lecture, informal meeting with a group of CSAM students. Interested students may sign up for this opportunity at the Dean's Office (RI-262) or by email at addisont@mail.montclair.edu. The first 20 students who sign up and attend will receive an autographed copy of his book. ♦

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Mathematics Pedagogy Ed.D. Approved

At the Friday, January 26 meeting of the New Jersey Commission on Higher Education, the commissioners unanimously approved Montclair State Universities petition to exceed its mission and offer its fourth doctoral program, an Ed.D. in Mathematics Pedagogy, housed in CSAM's Department of Mathematical Sciences. The new degree recognizes the maturation of the existing specialization in Mathematics Education within the Ed.D. in Pedagogy by converting it to independent program status. The Specialization in Mathematics Education was one of two specializations within the university's first doctoral program approved in 1998. Since

then seven candidates have successfully completed the degree. Currently there are fourteen active degree candidates at various stages of their doctoral studies.

Converting the existing specialization to an independent degree housed in the Department of Mathematical Sciences establishes a closer affiliation with the department's other programs in mathematics education including the MS in Mathematics with a concentration in mathematics education, the MA and post baccalaureate certificate in Teaching Middle Grades Mathematics, and the undergraduate program that supports students pursu-

ing certification to teach mathematics in New Jersey's schools and thus increase the visibility of the new degree and the department's other programs. It is expected that this increased visibility will result in an enlarged pool of potential degree candidates and increased enrollment in all department programs.

Current Students enrolled in the Ed.D. in Pedagogy with a Specialization in Mathematics Education have the option to continue in that program or transfer to the new degree. The new degree continues to combine coursework and research preparation from both CSAM and CEHS. ♦

New Degrees in Biology

The Department of Biology & Molecular Biology, with the largest student enrollment within CSAM, will be offering undergraduate and graduate students additional academic opportunities effective Fall 2007. Three new programs have recently been approved by the University's academic committees. A combined five year B.S./M.S. in Biology is now available to undergraduate biology majors. At the graduate level, two new concentrations, in

Physiology and in Ecology and Evolution, have been added to the M.S. degree in Biology. These new offerings augment the current available degrees - B.S. in Biology (with concentrations in Environmental Science and in Biology Education) and B.S. in Molecular Biology, M.S. in Biology, M.S. in Molecular Biology, and a concentration in Science Pedagogy. A graduate certificate program in Molecular Biology is also available. ♦

Student Research Symposium Announced

The Montclair State University College of Science and Mathematics, the College of Humanities and Social Science and the MSU Chapter of Sigma Xi will host its premiere Student Research Symposium on Saturday, May 5, 2007.

This important academic event will showcase and award outstanding scholarship and research by students who will share their work through poster display, oral presentation and manuscript publication with the aca-

demic community, their peers and the greater community. The conference will provide an opportunity for students:

- To produce an on-line, peer reviewed journal of select student research;
- To enhance the educational experience through original research conducted by talented, motivated students; and,
- To encourage and stimulate academic interest and participation in research and publication, one of the

hallmarks of the academic experience.

Corporate sponsorship includes Organon Pharmaceuticals, ReGenesis LLC, Schering Plough Corp., and Wyeth Pharmaceuticals.

Abstracts will only be accepted online and are available at <http://chss.montclair.edu/UndergradSymposium.htm>. ♦

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Kudos

Dr. Paul Bologna (Biology & Molecular Biology), Dr. Youngna Choi (Mathematical Sciences), Dr. Mark Chopping (Earth & Environmental Studies), Dr. Charles Du (Biology & Molecular Biology), and Dr. Mika Munakata (Mathematical Sciences) were recently awarded tenure. Congratulations! And, the following CSAM faculty received promotion to the rank of Associate Professor: Dr. Sandra Adams (Biology & Molecular Biology), Dr. Mark Chopping (Earth & Environmental Studies) and Dr. Arup Mukherjee (Mathematical Sciences).

Dr. **Lora Billings** (Mathematical Sciences) is the principal investigator on a 3-year \$133,426 grant from the ARO Mathematical Sciences Research Area of Cooperative Systems to investigate "Controlling interacting

systems in noisy environments." She also was the plenary speaker at the Mathematical Association Of America New Jersey Section - Fall Meeting. Her speech was on the "Antibody dependent enhancement: Complex dynamics in the evolution of diseases." In October, 2006, she lectured on "Multi-strain disease models with antibody-dependent enhancement," at the Mathematical Biology Seminar Lecture, Center for Applied Mathematics and Statistics, NJIT, Newark, NJ and gave an invited lecture titled "Multi-strain disease models with antibody-dependent enhancement" at the DIMACS workshop on Models of Co-Evolution of Hosts and Pathogens, Rutgers University, New Brunswick, NJ.

Dr. **Aihua Li** (Mathematical Sciences) was appointed as the Liaison

Coordinator of the Mathematical Association of America NJ Section and she participated in the fall sectional meeting of MAA held at Seton Hall University. In November, Dr. Li participated in the Graph Theory Day 52nd Conference held at West Point in which she gave a short talk on a graph theory problem. In December, she presented on mathematics and bioinformatics to two groups of high school students during the MSU Science Informatics Day. In January 2007, Dr. Li was invited to be a panelist in the MAA panel discussion on the "Mathematics and Mathematicians in Emerging Nations" during the AMS/MAA joint annual meeting held in New Orleans. In the same meeting, she also gave a presentation in the MAA session on "Getting Students to Discuss and to Write about Mathematics." The title of her

presentation is “Projects that Encourage Students to Talk and to Write about Mathematics.”

In October 2006, Dr. **Duke Ophori** (Earth & Environmental Studies) presented “Simulation of the effects of groundwater pumping on wetareas, Passaic River Watershed, New Jersey” at the 9th Annual Wetlands and Watersheds Workshop in Atlantic City and “Simulation of groundwater response to development, Passaic

River Basin, New Jersey” at the Second Passaic River symposium: Progress and Challenges held at MSU. Prior to that he delivered 2 papers, “A preliminary simulation of large-scale groundwater flow in the Niger Delta, Nigeria” and “Groundwater quality of shallow domestic water supply wells, Ughelli, Nigeria,” co-authored with **M. Gorrington, K. Olsen**, J. Hope and E. Orhuah at the 41st International Conference on Infrastructural Development and the Environment in

Abuja, Nigeria.

A Research Grant on brownfields site investigations in New Jersey was awarded to Dr. **Robert W. Taylor** (Earth & Environmental Studies) and Ms. **Amy Ferdinand**, a Doctoral Student in Environmental Management, by the New Jersey Office of Smart Growth to develop a brownfields database for properties in Essex and Passaic Counties to add to the New Jersey SiteMart Database. ♦

Calendar of Events

January 25, 2007

CSAM Seminar in Biology & Molecular Biology
Dr. Pranela Rameshwar - UMDNJ
“*Perspective on Stem Cells: Direct and Indirect Clinical Applications*”
4:00 p.m. - Sokol Seminar Room

February 13, 2007

Professional Speaker Series
Ms. Nicole Troisi - Wildlife Animal Facility, Six Flags
“*How I Got My First Job*”
6:30 p.m. - Sokol Seminar Room

March 2, 2007

CSAM/NJTC Conference
“*Commercializing Nanotechnology in Opto Electronics*”
9:00 a.m. to 2:00 p.m. – Richardson 120

March 8, 2007

CSAM Seminar in Chemistry & Biochemistry
Dr. Qing-Xiang Amy Sang, Florida State University
“*Biomarker and Enzyme Inhibitor Discovery for Targeting Human Breast and Prostate Cancer Invasion using Multidisciplinary Approaches*”
4:00 p.m. - Sokol Seminar Room

March 22, 2007

CSAM Seminar in Earth & Environmental Studies
Dr. Dinah Koehler, National Center for Environmental Research USEPA
“*Going Beyond Compliance and Corporate Environmental Response*”
4:00 p.m. -Sokol Seminar Room

March 29, 2007

Margaret & Herman Sokol Science Lecture Series
Dr. Robert Hazen - Geophysical Lab George Mason Univ.
“*Genesis: The Scientific Quest for Life’s Origin*”
8:00 p.m. - Kasser Theater

April 12, 2007

Professional Speaker Series
Ms. Amal Johnson, CEO MarketTools
“*My career path: From high school teacher to CEO*”
6:30 p.m. - Sokol Seminar Room

Thursday April 19, 2007

CSAM Seminar in Mathematical Sciences
Dr. David Helfand, Columbia University
“*Universal Timekeeper: Reconstructing History Atom by Atom*”
4:00 p.m. – Sokol Seminar Room

May 5, 2007

Student Research Symposium

May 14, 2007

CSAM Convocation
7:00 p.m. - Amphitheater

May 18, 2007

MSU Commencement

May 31, 2007

MSU/Roche Middle School Teaching Excellence Awards
4:30 to 7:30 p.m. - University Conference Center