College of Science, Technology, and Health

Fall 2013

Applied Medical Sciences
Biological Sciences
Chemistry
Computer Science
Engineering
Environmental Science
Exercise, Health, and Sport Sciences
Geosciences
Linguistics
Mathematics and Statistics
School of Nursing
Physics
Psychology
Recreation and Leisure Studies
Technology
Dean’s Corner

The Times They Are A-Changin. In the years I have worked in education, I have often heard the phrase from the Bob Dylan song, or something very close to it. And true to the lyrics, there have been changes.

The changes have happened at many levels and range from a significant reorganization of academic units at USM to the evolving way we communicate with students and the public. We continue to take advantage of technology in developing new ways to interact with students and the community. Most faculty now regularly use computer-based management software to assist in distributing and collecting course materials as well as managing communication with students. We use social media to keep those interested informed about the activities of the university, college, programs, and even individual courses. We have joined the millions of others in regularly posting messages, pictures, and videos on Facebook and YouTube. While this may seem to be a subtle change, one cannot underestimate the potential impact of sharing information in a venue that has such a significant user base.

Even more fundamental are changes occurring in our approach to teaching and learning. We continue to seek ways to prepare graduates that not only understand the content and practice of their discipline, but also possess the knowledge and skill to identify and solve problems, communicate and share ideas, provide leadership, and act in a socially responsibility way. We increasingly look for ways to provide students with opportunities to learn and practice those skills both inside and outside of the classroom. For example, many undergraduate and graduate students work along with faculty on research projects that develop some extraordinary skills. Students may be studying the impact of toxic metals on marine mammals, the development of new computational tools to better understand the interactions between genes and the environment, or innovative ways to improve the quality of life among breast cancer patients. They not only learn approaches to investigating and/or solving “real-world” problems, but also gain skill in sharing their research in group discussions, published journals, and national conference presentations. This likewise happens in other areas, such as clinical experiences, internships and similar activities.

At yet another level, there are those seeking to develop innovative approaches to the traditional classroom. For example, several faculty are experimenting with what is often referred to as a “flipped classroom.” This approach is designed to allow a large piece of the lecture portion of a course to be moved outside of the classroom in the form of online content. Faculty and students then use more of the classroom time employing that knowledge in solving problems and engaging in group-based activities. This and other approaches contribute to helping students understand the content in a manner that is meaningful, fits individual learning styles, and is highly motivating. There are a number of other examples of experiential and problem-based learning detailed elsewhere in this publication.

Change will continue to happen as we face challenges and explore opportunities. While we are keenly aware of the ongoing issues of state and federal budgets, an increasingly competitive education market, and changing demographics in Maine and New England, we have seen evidence that opportunities remain in exploring ways in which we can impact the lives of our students and make meaningful contributions to the community. I know you will enjoy witnessing some of those impacts and contributions in this issue of CSTH Today.

Andrew L. Anderson, Dean of the College of Science, Technology, and Health, can be reached at csth@usm.maine.edu.
Monroe Duboise
Groundbreaking Research in Global Health and Development

Dr. Monroe Duboise, Associate Professor of Molecular Biology and Microbiology, has been on a quest to develop a malaria vaccine that is more stable, inexpensive, and easy to produce in a wide range of locations. It’s an idea so bold, it received funding from a Bill and Melinda Gates Foundation Grand Challenges Explorations grant.

“Optimizing Immunization Systems by Development of Extremophile Bacteriophage-based Vaccine Platforms” is an innovative global health and development research project led by Duboise and his team of graduate students. The project was one of over 100 Grand Challenges Explorations Round 8 grants awarded in 2012.

Dr. Duboise’s project builds upon previous work performed by researchers at USM and the University of Nairobi in Kenya to isolate and complete the genomic DNA sequencing of bacteriophages, viruses that infect bacteria. These viruses are structurally stable in one of Earth’s most extreme environments, the hypersaline alkaline soda lakes of Kenya’s Great Rift Valley. Dr. Duboise and his team have proposed using bacteriophage from this extreme environment as a platform for developing an anti-malaria vaccine that will be relatively stable and readily produced using highly scalable and adaptable methods.

The research of doctoral student, Naun Lobo, and other USM students working with Dr. Duboise has provided the important structural knowledge of the bacteriophage that is making the vaccine design process possible. If the team is successful using this process to develop a vaccine against malaria, the process may be used to create vaccines for other diseases as well.

Dr. Duboise has a Ph.D. in epidemiology of infectious disease from Yale University and is a broadly trained microbiologist with a specific interest in bacteria and bacteriophages in extreme environments. During the 2012–2013 academic year, he was awarded the University of Maine System Trustee Professorship at USM, an honor established to reward excellence among faculty members at each University of Maine System campus.

USM establishes Tom Knight Memorial Scholarship

Dr. Thomas Knight, Associate Professor of Biological Sciences, passed away unexpectedly in January 2013. To honor his devotion to his students and his passion for teaching, the Department of Biological Sciences has established a needs-based scholarship for a student who has a serious interest in biology, is working hard, and is showing progress in his or her studies.

Donations to the fund in honor of Tom’s memory can be made by check or online, with special care to designate the gift to the Tom Knight Biology Scholarship.

Please make checks payable to:
University of Southern Maine
Note in memo line: Tom Knight Biology Scholarship

Mail to:
Advancement & Donor Services
University of Southern Maine
PO Box 9300
Portland, ME 04104-9300

To make an online gift, please visit http://www.usm.maine.edu/giving
Select “Donate Now”
Under Gift Details, in the Designation Box, type “Tom Knight Biology Scholarship”
Professor Lisa Moore part of $13M NSF project to build a comprehensive Tree of Life

A Tree of Life with 1.8 million branches? Dr. Lisa Moore, Professor of Biological Sciences, will be working on such an evolutionary map as part of a National Science Foundation (NSF)-funded research project to depict how all species are related and can be traced back to a common ancestor.

Since Charles Darwin first sketched his concept of an evolutionary tree of life in the early nineteenth century, scientists have been working to discover the relationships between different groups of organisms, but have only determined small sections of the entire tree.

Dr. Moore received a three-year, $294,000 NSF grant to work in collaboration with a team of researchers from around the U.S. to assemble and analyze a Tree of Life focusing on the microbial world. Her project is one of the three in the NSF’s $13 million “Assembling, Visualizing, and Analyzing the Tree of Life” (AVAToL) program that will build a comprehensive Tree of Life accessible to scientists, students and the public.

Moore’s project, “Next Generation Phenomics for the Tree of Life,” will use a multidisciplinary team of biologists and computer scientists across the country to develop methods that will allow students and the public to participate in the collection of phenomic information, the data needed to understand how organisms evolved and how they are related to each other.

“I became interested in this idea of pulling together phenomic information to help annotate the Tree of Life while teaching microbiology here at USM,” adds Moore. “I am excited to be part of this project and am looking forward to working with students at USM who will get to test drive some of the methods that we will be developing.”

The AVAToL program also supports efforts to create an online version of the tree containing information about all 1.8 million named species. Creating this central and online resource will allow the tree to be dynamic and evolving. Updates and revisions can be made as new data comes in as a result of the methods developed by Dr. Moore’s and other AVAToL teams.

Lisa Moore can be reached at lmoore@usm.maine.edu.

USM and Cornerstones of Science launch Science Café Series at Portland Public Library

Last fall, the University of Southern Maine and Cornerstones of Science announced the launch of a series of Science Cafés held monthly at Portland Public Library. The fall Science Cafés in the Atrium centered around the 50th anniversary of Rachel Carson’s book Silent Spring, to explain how far we have come and what challenges remain since its publication in 1962. Researchers from the College of Science, Technology, & Health led discussions based on research underway at the university that seeks to better understand human-environment relationships in the fields of biology, chemistry, and ecology.

Presenters included:
• Dr. Dave Champlin, Biology
• Dr. Travis Wagner, Environmental Science
• Dr. Lucille Benedict, Chemistry

These USM researchers shared the real stories behind their research in Maine and why it’s important to us today and in the future. The Science Café format is an informal approach to discussing and understanding scientific research and its relevance to people in their everyday lives.

The Science Café events are held in Portland Public Library’s open, glass-walled atrium that faces Monument Square in Portland at the end of the school/work day and offer light refreshments in an informal, casual atmosphere. Students, young professionals and anyone interested in getting the inside look at what scientists are doing – and why – are invited to attend.

More Science Café events are planned for the 2013-2014 academic year.

Visit usm.maine.edu/csth/sciencecafes for dates and topics.
During the Spring 2013 semester, students in Mark Swanson’s Digital Mapping course took advantage of a unique opportunity to map and survey Schoodic Point in Acadia National Park.

“The project sprang up out of nowhere after a chance visit the past fall,” explains Dr. Swanson. “It had tremendous potential for a really spectacular map of Schoodic Point and an interesting structural study of some newly recognized faults.”

The spectacular light colored granite coastal exposures at Schoodic Point have long been famous for their contrasting dark dike intrusions. When Swanson visited the Point the previous fall, he observed that the granite is filled with strike slip faults, both left and right lateral, of several different generations that nobody has ever noticed before. This creates a complex and dramatic story of the brittle deformation history to match the spectacular and dramatic nature of these impressive coastal exposures—all of which will be captured digitally in the survey project using an arsenal of digital surveying equipment and the GIS lab.

To complete the survey project, Dr. Swanson and his students are taking long weekend surveying trips to Schoodic Point during USM’s spring and fall semester courses. The group is staying at the Schoodic Education and Research Center (SERC) on site, with funds for the trips provided by the Office of the CSTM Dean and the USM Provost. Students will complete the careful digital surveying of all the dike and fault structures in the nearly kilometer-long exposure. The map will most likely take two to three years to complete.

“We had two spring semester survey trips to Schoodic. Both weekends were really cold, but the students had a great and adventurous experience,” recalls Swanson. “I heard several students remark how exciting it was to be out at this grand shoreline with waves crashing and the magnificent views to Mount Desert Island while unraveling some complicated dike intrusion history.”

This mapping and surveying project provides an extraordinary hands-on learning experience for the students and gets them directly involved in field research.

“This is a great activity and an experience students will likely remember well beyond their time at USM,” adds CSTM Dean Andrew Anderson.

Mark Swanson can be reached at mswanson@usm.maine.edu.
USM School of Nursing Students Partner with the Community

School of Nursing students gain relevant, hands-on nursing experience through participation in one of eleven community partnerships. These partnerships allow the School of Nursing to deliver valuable services to Maine communities while providing nursing students with practical experiences that are central to their nursing education. Over the course of two semesters, students engage in a specific community partnership that incorporates relationship building, risk identification, and health promotion within a community-based context. Students obtain an understanding of the community’s needs and develop interventions to address those needs. Each of the eleven community partnerships has a unique focus.

The Casco Bay Fishing and Islands Community Partnership focuses on individuals and families in the commercial fishing industry, and people living on remote islands in Casco Bay. Students plan and implement health screening clinics on Long, Cliff and Chebeague Islands and at the annual Fishermen’s Forum in Rockland.

The Bayside Neighborhood Partnership promotes wellness for working poor and homeless individuals through health screenings, holiday support activities, youth mentoring, medication education, and a yearly health fair.

In the Parkside Community Nursing Partnership, students identify the needs of individuals and families from many nationalities, some of whom are refugees or seeking asylum, and match those needs with community-based programs currently being offered.

Nursing students in the Ocean Avenue Elementary School Partnership in Portland mentor a child for two semesters, teach health-related topics in the classroom, and work closely with the School Nurse.

Through the Amistad Partnership, based at the Amistad Peer Support and Recovery Center in Portland, students provide health screenings and other support to individuals who live with severe and persistent mental illness and other life stressors, such as homelessness, chemical dependency, and chronic diseases.

The Greater Portland Older Adult Partnership, in collaboration with the Southern Maine Agency on Aging, promotes healthy aging and disease prevention among older adults. This intergenerational experience provides shared learning among students and older adults, with opportunities to learn self-care strategies and have fun.

In the Maine Medical Center Elderlife Program Community Partnership, students learn strategies to improve and maintain the health of older adults who have been hospitalized, with a focus on supporting the individual’s independence, physical and cognitive functioning, and spiritual well-being.

The Dominican Republic Community Partnership offers an international service-learning experience in which students spend two weeks in Dominican rural communities assessing public health issues, delivering primary health care, and making home visits to approximately 2,000 clients of all ages.

In the Sagamore Health Clinic Community Partnership, students work at the Sagamore Health Resource Center to provide primary care, public health, and mental health services for Sagamore Village’s roughly 500 low-income residents. The center is managed by faculty from the School of Nursing in collaboration with Sagamore residents, Portland Housing Authority, and Maine Medical Center.

Two community partnerships focus on the needs of residents in the Lewiston-Auburn area. In the Lewiston Community Partnership, students work at drop-in centers, women’s resource centers, and low-income housing units to assist clients with their health management. Students partner with several agencies to support community members, including the elderly, homeless, poor, and disenfranchised. The aim is to meet community members where they are and work with them to make incremental changes toward improved health.

In the L/A Community CARE (Cancer, Awareness, Resources and Education) Partnership, students assess the needs of and resources available to patients in the community who have cancer. This partnership represents an experience in which students may share some of the most difficult yet moving moments in a cancer patient’s life.
Jonas Nurse Leaders Scholar Program expands to include USM

The Jonas Nurse Leaders Scholar Program was created to support the educational development of new nursing faculty and to prepare doctoral candidates to help students address the needs of future patients. In 2012, the program reached across all 50 states and awarded a grant to USM's Doctor of Nursing Practice (DNP). The DNP at USM prepares experts in specialized advanced nursing practice and focuses heavily on innovative and evidenced-based practice that reflects the application of credible research findings.

The Jonas Nurse Leaders Scholar Program grant supports two part-time DNP students at $5,000 per year for two years and provides funding for the two students to attend a leadership symposium.

School of Nursing Director Krista Meinersmann selected to participate in AACN-Wharton Executive Leadership Program

Krista Meinersmann, Director of the School of Nursing, has been chosen as one of 37 leaders in nursing education to participate in the inaugural class of the American Association of Colleges of Nursing (AACN)-Wharton Executive Leadership Program. USM is the only northern New England program represented in the leadership program which brings together nursing deans and senior faculty leaders from across the country.

"Many of those participating are from larger schools with national recognition. I feel honored to have been selected," says Dr. Meinersmann. "Through participation in this program, I hope to enhance my ability to lead the School of Nursing in a rapidly changing academic and health care environment."

While Wharton and many other schools offer executive leadership programs, this partnership with AACN has produced an innovative program that is the first of its kind to focus exclusively on the needs of leadership of nursing programs. The four-day program is designed to provide the concepts and tools participants need to enhance their leadership capacity and hone essential skills that enable them to move forward strategically as academic leaders.

Krista Meinersmann can be reached at kmeinersmann@usm.maine.edu.

In addition to her research activities, Dr. Spross is actively engaged in university activities, currently serving as coordinator for the Faculty Commons initiatives at USM. She has also served as Chairperson of the USM Research Council and Dean of the (former) College of Nursing and Health Professions.

"Professor Spross was Dean when I came to USM in 2009," recalls Dr. Krista Meinersmann, Director of the USM School of Nursing. "Her leadership and guidance helped me to be successful during my first year. She has been engaged in multiple projects within the School of Nursing, the university, and community at large. Her work reflects the visionary leadership for which she was recognized."

Judith Spross can be reached at jspross@usm.maine.edu.

Judith A. Spross, Professor of Nursing, has been recognized by the Virginia Commonwealth University (VCU) School of Nursing as a “Visionary Leader.” As part of its 120th anniversary, the VCU School of Nursing recognized 120 alumni and faculty as Visionary Leaders during a gala in Richmond, VA in May 2013.

Dr. Spross, who received her master's degree from the VCU School of Nursing in 1977 (and later her Ph. D. from Boston College), has been a leader in advanced practice nursing, holistic care, and pain management. An active professional, she is involved in research directed at changing institutional and clinical practice.

“When we talk about transforming lives of students at USM, I know what it means in my heart!” says Dr. Spross. “My graduate experience at VCU was transformative in a much deeper way than I anticipated. While I was transformed by my education, I had no idea that it would help me realize dreams I did not know I had and be so satisfying.”

Judith Spross
Professor of Nursing recognized as visionary leader

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Judith Spross can be reached at jspross@usm.maine.edu.
Campus Ventures: Innovation in experiential education for STEM students

Campus Ventures is a university-based commercialization accelerator program created to help Maine companies, entrepreneurs, and university faculty advance technology-intensive projects and provide rich experiential learning opportunities for students. Campus Ventures uses real-world, applied research, development, and commercialization projects to bring relevancy to academic pursuits, build relationships with community partners, and promote economic growth and workforce development in Maine.

Experiential Education for Students

Campus Ventures recruits students for projects in which they can apply their subject-matter expertise and gain resume-worthy skills relevant to their career paths. Working in teams with professional project managers, students are presented with real milestones, budgets, and time constraints similar to what they will see in a typical workplace. During the academic year, students also attend professional development workshops that include career development discussions and guest speakers from industry. Activities in Campus Ventures are interdisciplinary, integrating such areas as mechanical and electrical engineering, chemistry, software, business, physics, linguistics, and manufacturing.

Now in its third year of operation, the Campus Ventures program is experiencing significant growth and has benefited a large number of students and faculty. To date, the program has engaged in applied research and commercialization projects, brought to market three new products, and provided over 80 undergraduate and graduate students with real-world project experience. University faculty, start-up companies, and both small and large businesses have utilized the program, resulting in the commercialization of several new inventions, the improvement of manufacturing and business processes, and the formation of a new company.

A Campus Ventures Faculty Commercialization Project: The Gorham Lamp

One of the Campus Ventures program's first beta projects was the "Gorham Lamp," a scientific instrument conceived by Dr. Joseph Staples, Lecturer in USM's Department of Environmental Science,
to aid in entomology research. Composed of an LED light ring and a series of translucent columns, the device was developed to give very fine control over specimen illumination. It is intended to be used as an accessory to standard stereo microscopes that enables professionals to study and document specimens using a variety of digital microphotography techniques. Campus Ventures students developed the device from a concept sketch provided by Dr. Staples. Over an 18 month period, the student team created proof of concept models and functional prototypes, and designed the instrument’s circuitry and controls. Recently, four finished prototypes were manufactured and are used in several Maine labs, including Dr. Staples’ lab in Gorham. As a result of this project, a New Invention Notification has been submitted as proof of new USM Intellectual Property.

A Campus Ventures Industry Commercialization Project: Newfield Design

Newfield Design is a West Newfield-based technology company involved in telecommunications interoperability. Their entry product is designed to allow municipal agencies to communicate seamlessly between the myriad land-mobile radio communication platforms available. Because of Newfield Design’s proprietary technology, first responders of all kinds can better communicate, collaborate, and respond to emergencies. With the chipset developed, Newfield needed assistance developing a software “front end” to allow an end user to interact and set up the device. USM computer science and electrical engineering students wrote the first generation software interface that is now being used to commercialize this technology and help this exciting startup company grow.

Select Current and Past Projects

ZSaas Cloud 9 – with Professor Wayne Cowart, Department of Linguistics

This project is focused on analyzing critical text documents, using computational linguistics to identify and fix error-generating natural language problems.

RareForm/TAC1 – with Professor Christopher Scott, Department of Exercise, Health, and Sport Sciences

This project involves the research, testing, and concept design improvements of a TAC1 suit designed to improve the training of individual athletic performance.

Beach Glass Transitions

The project team is developing a highly interactive web application to allow users access to the company’s senior care transition assistance services.

LooHoo Dryer Balls

The student team helped test various manufacturing methods to automate and scale up production of felted wool dryer balls.

The Campus Ventures Program can be reached at campusventures@usm.maine.edu. More information is available at usm.maine.edu/campusventures.

Chemistry Laboratory Updates

The analytical/physical chemistry lab in the science building is undergoing a transformation! Sparked by a donation of two new fumehoods from The Baker Company, renovations in the lab will modernize the facility, providing an upgraded space for faculty and student research.
Three leading Maine companies pledged their support this year to the USM Pioneers Program. Nestlé Waters N.A., Pratt and Whitney, and Sappi Fine Paper North America all invested in USM’s Science, Technology, Engineering, and Mathematics (STEM) initiative in support of the university’s efforts to expand the number of students entering the STEM fields in Maine.

“We are delighted to have these companies supporting the USM Pioneers Program. Support from leading Maine companies is key to producing positive outcomes in our STEM initiatives that strengthen our state’s efforts to flourish economically in the future,” says Mike Wing, Director of the Pioneers Program.

The impact of the program will extend far beyond its direct effect on the students chosen to be Pioneers. USM is increasing the numbers of students interested in pursuing STEM careers, strengthening STEM partnerships with business leaders, and helping to meet the workforce needs in the high-growth industries that drive our state’s economy.

“We anticipate having nearly thirty percent of our workforce retire in the next 5 years and so there is a huge demand for STEM-related jobs,” says Donna Cassese, Managing Director of Sappi’s Westbrook Mill.

“Our goal is to inspire young people to study and work in the STEM fields and educate them to be fully productive and successful in such careers,” adds Mike.

Patrick Doherty and Deedra Zeeh, sophomores in USM’s Pioneers Program, collaborated on research this past year with Dr. James Masi, Adjunct Professor of Engineering. Their focus was to develop a nano-particle alternative that was easy to implement at low temperatures in a lab or classroom setting.

As a result of their collaboration, the group co-authored the paper “Ferrites at Room Temperature: Materials Science, Chemistry, Physics, and Metrology on Tailored Compositions,” which was selected as a 2013 American Society for Engineering Education (ASEE) Northeast Section Conference Reviewed Paper. Doherty, a Biotechnology and Biochemistry student, and Zeeh, a Physics and Electrical Engineering student, presented the paper at the ASEE Northeast Section Conference held at Norwich University in March 2013. This was the first conference presentation by Pioneers students and a unique opportunity for undergraduate students.

“The research was interesting and led to excellent networking opportunities as well as continuing research in a variety of promising fields,” says Patrick.

“Patrick and Deedra did a fantastic job in their poise and delivery,” adds Dr. Masi, “We are very proud of them!”

The paper also resulted in the submission of a new invention notification with USM’s Office of Research Administration and Development. This is a first step towards filing the research as intellectual property.
Asteroid to be named after Physics Professor Julie Ziffer

The International Astronomical Union has recognized Associate Professor of Physics Julie Ziffer for her research by naming the 7,909th asteroid discovered after her. Orbiting between Mars and Jupiter, 7909 Ziffer is a carbonaceous asteroid, indicating that it has not been subjected to high heat and has retained its dark, coal-like surface.

Dr. Ziffer, who has focused her research on asteroids made of ice rather than rock, was part of a team that discovered ice on asteroids. One theory suggested by Ziffer's research is that much of the water on Earth was brought here as ice on asteroids that crashed into our planet billions of years ago.

Dr. Ziffer adds an important note about her asteroid: “It’s not on a collision course with Earth—that’s one of the first things I checked.”
The American Chemical Society (ACS) student chapter at USM has received a Green Chemistry Award for outreach activities conducted during the 2011-2012 academic year.

Out of 362 chapter reports submitted, the ACS Green Chemistry Institute® recognized 56 chapters who successfully engaged in three or more green chemistry activities during the academic year. In addition to recognition in Chemical & Engineering News and the student member magazine inChemistry, the winning Green Chemistry chapters received special recognition in the ACS Green Chemistry Institute’s e-newsletter, The Nexus.

The Green Chemistry award winning chapters were also honored at the 245th ACS National Meeting in New Orleans, Louisiana in April 2013. USM’s Chemistry Club frequently puts on performances to entertain and educate K-12 students about the principles of chemistry through engaging demonstrations. At Mahoney Middle School in South Portland, for example, the club smashed racket balls frozen by liquid nitrogen and launched an ethanol rocket.

The ACS Green Chemistry Institute® Governing Board commended Dr. Hank Tracy and faculty advisor Dr. Peter Woodruff for setting a fine example for other chapters and for being exemplary green chemistry ambassadors.

USM American Chemical Society student chapter receives Green Chemistry Award

Unlike many high school students who opt to attend college out of state, all three Wise siblings, John Jr., James and Cathy of Cape Elizabeth, chose to attend USM where their parents work in the Wise Environmental & Genetic Toxicology Laboratory. Their mother, Sandra Wise, is the lab’s program director, and their father, John Wise, is a professor of toxicology and principal investigator at the lab.

At USM’s 133rd commencement held on May 11, 2013, John Jr. and James received their bachelor's degrees. Both have worked in the Wise Lab alongside their parents since before they entered USM. Johnny’s next stop is Purdue University where he will pursue a Ph.D. in neurotoxicology, researching Parkinson’s disease. Johnny was named an Outstanding Student Leader at the recent USM Student Involvement Recognition Gala.

James is headed to “the other USM,” the University of Southern Mississippi’s Gulf Coast Research Laboratory. There, he will conduct research on the long-term impact of the Deep Water Horizon Disaster on fish. At USM, James participated in research on the Disaster’s impact on marine mammals and humans.

The boys’ sister Cathy, still an undergraduate at USM, plans to pursue a doctorate when her time comes. And what about the mother of these young scientists? Sandra received her Ph.D. in biochemistry and molecular biology, a UMaine degree offered in collaboration with USM.
In summer 2012, USM began offering a new interdisciplinary online Certificate of Gerontology Program designed to help professionals currently working with older adults, as well as individuals preparing for health and human services professions, develop their capacity to serve this clinically complex population.

The certificate program, offered through USM’s Professional and Continuing Education (PCE) department, offers classes in an online format in 7-week sessions, allowing students to focus on one course at a time. Students can complete the program’s five courses in one year by taking one course in each 7-week session, or they may proceed at their own pace.

The Certificate in Gerontology program is based on the interdisciplinary competencies recommended by the Partnership for Health in Aging. Courses are taught by faculty from a range of disciplines, including health sciences, social work, therapeutic recreation, and nursing, among others. The variety of topics covered in the certificate courses, such as “Rehabilitation Services for Older Adults” and “Aging and the Search for Meaning,” attracts students from many different degree areas.

One of the certificate’s core course requirements is for students to take part in a community experience. This requirement has led many students to volunteer at area agencies, where they gain both relevant experience and networking opportunities.

The Certificate of Gerontology Program is continuing to grow. For more information, visit the PCE website at usm.maine.edu/pce.

Nancy Richeson, Coordinator of the Gerontology Certificate Program, can be reached at richeson@usm.maine.edu.
USM Mechanical Engineering student wins UMaine Business Challenge and new Technology Prize

Mechanical Engineering student Tom Myers has won the 2013 UMaine Business Challenge, a student business plan competition based at the University of Maine in Orono. Tom's business plan for a local firewood business includes the development of an innovative, high-capacity mechanism to cut and process cordwood from full tree-length logs. Tom received a $5,000 cash prize and in-kind legal, financial, and marketing services from area businesses.

The 2013 UMaine Business Challenge is principally operated by UMaine 2010 alumni James Morin and Owen McCarthy. The competition was piloted at USM this year, with a goal to extend the competition to all UMaine System branches in 2014.

Tom's plan was selected from a group of four finalists who were selected from a field of 17 applicants from UMaine and USM. Coordination of the competition at USM is managed by Greg Cavanaugh, Program Manager in USMs Department of External Programs in the College of Science, Technology & Health.

Tom was also awarded a new Technology Prize, generously funded by the Maine Technology Institute, Blackstone Accelerates Growth, the University of Maine, and the University of Southern Maine Manufacturing Applications Center. The Technology Prize winner is granted a client spot in Campus Ventures, USM’s commercialization accelerator program.

Tom was recognized for his achievement at this year’s USM College of Science Technology & Health Student Recognition Banquet. Development of his prototype firewood processing equipment commenced during summer 2013.

Mechanical Engineering Faculty and Student to Present at National Conference

Dr. Mehrdaad Ghorashi, Assistant Professor of Mechanical Engineering, and Jacob Finley, a mechanical engineering major, have had a paper accepted for publication and presentation at the 120th national American Society of Engineering Education (ASEE) annual conference in Atlanta, Georgia. The paper, “The Effective use of an Undergraduate Research Fellowship for Design and Manufacture of Tools to Assist in Teaching Strength of Materials,” highlights research activities pursued by Jacob during an Undergraduate Research Fellowship (URF) in the summer of 2012 under the supervision of Dr. Ghorashi.

During the course of his fellowship, Jacob designed, fabricated, and tested four experimental devices, now being extensively used as teaching tools in strength of materials and design of machine elements courses in the mechanical engineering program at USM.

“Such hands-on activities are crucial for the proper education of engineers,” explains Dr. Ghorashi. “Some students who get bored in a formal lecture setting, after gaining a personal hands-on experience related to a subject, suddenly become the most interested ones. The reason is because students observe that what they study in the lectures is not just intangible theory. The final outcomes, in fact, have realistic meanings that can be tested, touched, and seen. A teacher can then use this momentum to help students understand the related theories and formulations as well.

Mehrdaad Ghorashi can be reached at mghorashi@usm.maine.edu.
Retiring Faculty

Four faculty members from USM’s College of Science, Technology, and Health have announced their retirement in 2013. We thank them for their many years of service and dedication to the University of Southern Maine and wish them well in their new adventures!

**Linda Meyer, Ph.D., CPRP, Recreation and Leisure Studies**
Dr. Meyer received her Ph.D. in Education, with emphases in the Psychology of Disability, Special Physical Education, and Therapeutic Recreation from the University of Connecticut. Her teaching specialties included recreation program development and inclusive and specialized recreation. Dr. Meyer’s scholarship focused on recreation assistive technology. Over her career, she researched and developed dozens of assistive devices that provide persons with disabilities access to recreation. She also serves as director of the USM Recreation Assistive Technology Exchange (RATE) which provides information about assistive devices and specialized recreation opportunities to Mainers and other interested persons.

**William T. McCullough, Ed.D., CTRS, Recreation and Leisure Studies**
Dr. McCullough has over 40 years of experience providing recreation and leisure experiences to individuals with a wide variety of disabilities. During his time at USM, he taught numerous courses throughout the curriculum and supervised student interns at various sites in Maine, New England, and farther afield. On two occasions, he taught for a semester in England and served as Department Chair for over 10 years. His scholarly interests included international education and animal assisted therapy in the lives of those with disabilities. He also served on the Boards of two significant community agencies - The Maine Resource Development Corporation, a group home and an independent living program which provides residential care and related services for adults with developmental disabilities, and Riding to the Top, a nationally known therapeutic riding program which serves children and adults with a variety of developmental, physical, and psychiatric disabilities.

**Janis Childs, Ph.D., RN, Nursing**
Dr. Childs’ research and scholarship of teaching focused on the integration of simulation into nursing curriculum, learning resource centers in nursing, and service learning. Dr. Childs has published in all of these areas as well as presented at numerous schools, conferences and symposia. She was awarded several teaching and research awards including the 2005 International Nursing Association of Clinical Simulations’ (INACLS) Research Award. Dr. Childs was one of the 8 Project Coordinators involved in the national, multi-site, three year, NLN/Laerdal Research Study on Simulation in Nursing Education (2003-2006). Dr. Childs is one of the founding members of INACSL and served as the first Vice President for Communication.

**Marjorie Lawson, Ph.D., APRN, BC, FNP, Nursing**
Dr. Lawson is a Family Nurse Practitioner (FNP) who received her Bachelor of Arts degree in Biology from Thiel College, her Bachelor of Science degree in Nursing from the University of Pittsburgh, her Master of Science degree in Nursing as a Family Nurse Practitioner from Pennsylvania State University, and her Ph.D. in nursing from the University of Rochester. She served as a faculty member in the USM School of Nursing and also as Coordinator of the Graduate Nursing Programs. Additionally, Dr. Lawson worked as an FNP at University Health Services for a total of 13 years on the Portland campus. Her practice background includes: working as a FNP in rural Appalachia sites as a Commissioned Officer in the United States Public Health Service, women’s health clinics, family practice centers, a university and medical center collaborative women’s center for uninsured, and college health services. Her professional interests and research areas include provider-patient communication, decisional control in the provider-patient relationship, patient self-determination, collaborative practice, and the integration of genetics in advanced nursing practice.
Scholarships and Awards

This year, the College of Science, Technology, and Health awarded over $380,000 in scholarships, some of which were four-year awards. These scholarships were made possible through grants and the generosity of our donors.