



Doug Thompson

Thompson Leads Cancer Research Project

USM is collaborating with a number of research centers in the United States and overseas to conduct a major epidemiologic study of the interaction between genetic predisposition and environmental exposures in relation to human breast cancer. The central hypothesis of the study is that inherited mutations of a certain gene render women particularly vulnerable to developing radiation-induced breast cancer.

The gene under investigation is located at chromosome 11q23.1. Persons with mutations in both copies of this gene suffer from a rare and fatal condition known as ataxia telangiectasia (AT). Among the serious health problems that these patients manifest is an unusually severe and devastating hypersensitivity to the adverse effects of exposure to ionizing radiation. The current research focuses not on this small group but on the much larger segment of the population that has just one mutated copy of this gene. This group is thought to share with ataxia telangiectasia patients some degree of hypersensitivity to radiation. The purpose of the current research project is to evaluate just how susceptible women with one mutated copy of the AT gene might be to radiation-induced breast cancer.

The women being studied are all breast cancer patients. Of this group, some go on to develop a new cancer in the opposite breast subsequent to treatment for their first breast cancer. Because some women treated for their first cancer receive radiation therapy and others do not, the investigators will be able to compare those receiving and not receiving radiation therapy in terms of the risk of developing cancer in the opposite breast. Previous studies have already established that young women treated with radiation therapy for a first breast cancer have a somewhat increased risk of subsequently developing breast cancer in the other breast. This adverse effect of radiation therapy results from the impossibility of completely shielding the opposite breast when irradiating the first breast cancer.

In order to provide reasonably definitive results, a large number of breast cancer patients must be available for possible inclusion in the study. Consequently, several large populations are being reviewed to identify eligible breast cancer patients. These areas include Los Angeles and Orange Counties in California, the greater Seattle area, the State of Iowa, and the entire country of Denmark.

The required laboratory work for the evaluation of mutations of the AT gene is also formidable. Laboratories at the Fred Hutchinson Cancer Research Center in Seattle, at the University of Southern California, and elsewhere will collaborate on the genetic aspects of the research.

This ambitious multi-million-dollar undertaking is being coordinated by Dr. Jonine Bernstein at the Mount Sinai School of Medicine in New York. Dr. W. Douglas Thompson at USM is co-principal investigator for the project and is leading the epidemiologic design of the research and the statistical analysis.

Hopefully, projects like this one will help in the development of new approaches to the treatment of breast cancer and to prevent it from occurring in the first place.

Dr. Thompson and his collaborators have recently expanded the scope of their research in order to evaluate the role that two genes shown to be important in human breast cancer (BRCA1 and BRCA2) may play specifically in radiation-induced cancers.

The result of this research is expected to give new insights into the causes of breast cancer and into the specific mechanisms through which ionizing radiation has an effect on the disease.

Hopefully, projects like this one will help in the development of new approaches to the treatment of breast cancer and to prevent it from occurring in the first place. The results may also assist in identifying small subgroups of women who are particularly sensitive to the effects of radiation and who should therefore perhaps be screened for breast cancer using methods other than conventional mammography.

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John Wright

Dean's Corner

Construction barriers, ladders in the corridor, pneumatic drills hammering away, and occasional diesel fumes flowing through the building...progress...what a great experience! We are under construction and our new 23,000 sq. ft. Advanced Technology Wing is becoming a reality. It has been a long haul to get where we are, but thanks to our partners in progress we have been able to move the project forward.

And just in time (JIT), like a fine-tuned manufacturing system, we are right on target to expand with the economy as we begin to see positive indicators that Maine's companies are again experiencing profit and growth. Increased profit and growth means demand for new employees who can enter the workplace with appropriate skill sets and knowledge. The construction of the Advanced Technology Wing on the John Mitchell Center in Gorham and the addition for the Bioscience Research Institute in Portland will provide USM with additional opportunity to attract new students in engineering, technology, immunology, computer science, and environmental science.

I want to take this opportunity to acknowledge and thank the supporters of the new Advanced Technology Wing. The state legislature had the vision and fortitude to provide a \$4 million grant in the form of

a bond issue that the taxpayers of Maine supported. This base allowed us to apply for federal funding that was supported by our Maine delegation and brought another \$2 million to the fund. Since then, Kirk Pond, CEO of Fairchild and honorary chairperson of our capital campaign, and Kal Kotkas, senior principal of the Inplan Group LLC and chairperson of the campaign, have helped us raise another \$1 million from the private sector. The overwhelming support by industry has really made this a project of collaboration and economic/educational vision between the public and private sectors. My thanks to all of our committee volunteers and to those who have generously supported this exciting capital campaign.

The Economic Development Strategy for Maine, announced by Governor Baldacci, highlights the importance of USM's mission and initiatives in science and technology. It addresses the importance of investing in our citizens through education. The strategy states, "The most important measure of economic development in Maine is the educational attainment of its people and the opportunities that arise from our people's participation in the economy of tomorrow" (<http://econdemaine.com/GOVeconomicStrategyJan212004.htm>, p.1). ASET's professors and researchers are actively involved in the economy of tomorrow. We are working with the workforce of tomorrow, we are doing the research of tomorrow, and we are poised to capture the opportunities of tomorrow.

Despite the recent financial constraints of the state and university, we do our best to meet the challenges ahead and continue to pursue our vision, goals and objectives for ASET by focusing on the following initiatives:

- Ramp up for workforce development/demands for science and technology
- Push down for public school support
- Push sideways for interactive collaboration with Southern Maine, Eastern Maine, Central Maine, Northern Maine, and York Community Colleges

- Develop research collaborations in bio-sciences, information sciences, and precision manufacturing
- Enhance facility capabilities for engineering and technology
- Reach in to enhance student success
- Reach out via External Programs

Our academic programs are strong and enjoy national recognition. Accreditation documents that our standards are high and second-to-none in quality. Dozens of companies help us extend our educational experiences into the workplace through internships, cooperative education, senior projects, independent studies, and research projects. This collaborative effort also extends our classrooms into our product testing center for product design, development, engineering, and prototyping. Combined, our classroom theory and practical application prepare a high quality, college-educated engineer, technologist, or applied scientist for that "economy of tomorrow."

This newsletter is full of exciting items of interest. As you read the newsletter and get a sense of how ASET is moving forward, I hope you'll share your copy with a colleague, friend, or family member. Enjoy this issue.

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The ASET newsletter is distributed to alumni, friends, faculty, students, and staff. Requests for copies, changes of address, and other communication can be sent to:

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We welcome submissions from our alumni for potential publication.

ESP Moves to ASET

USM Provost and Vice President for Academic Affairs Joseph Wood recently approved moving the environmental science and policy program (ESP) from the College of Arts and Sciences to the School of Applied Science, Engineering, and Technology. The degree program will be merged with the environmental safety and health degree to form a new Department of Environmental Science (DES) within ASET. The environmental safety and health degree is being moved from the Department of Technology into the newly formed unit. The move recognizes that the teaching, research, and service activities of ESP are consistent with those of an applied science and fit better with the mission of ASET.

Three faculty from the environmental science and policy program will join ASET and each brings an area of expertise to the new department. Associate Professor Samantha Langley-Turnbaugh, who has an undergraduate degree in civil engineering, a master's degree in soils science, and a Ph.D. in forest soils, brings expertise in the areas of soils and forestry. Associate Professor Robert Sanford provides experience in archaeology and environmental planning, having obtained a master's and Ph.D. in environmental science. Assistant Professor Travis Wagner obtained a Ph.D. in environmental policy and primarily works in the areas of hazardous waste policy and regulation. Assistant Professor Sharon D'Orsie, who will transfer from ASET's Department of Technology to the new department, has an undergraduate degree in chemistry and graduate work in industrial hygiene. She has significant work experience in environmental health, safety, and indoor air quality, having worked for a major oil company and later owning a successful consulting firm.

The faculty have been active with research and service activities. They are in the second year of implementing a \$200,000 National Science Foundation (NSF) Course, Curriculum and Laboratory Improvement (CCLI) grant, to modify the curriculum to focus on problem-based, cohort learning. The grant also supported the purchase of an Inductively Coupled Plasma Emission Spectrometer (ICP), which is the centerpiece for a five-course sequence that integrates problem-based learning.

Professor Langley-Turnbaugh is currently working in partnership with the city of Portland Health and Human Services Division in the Parkside neighborhood in Portland, examining the extent of soil lead contamination in the neighborhood. This spring phytoremediation with spinach will be used to extract lead from the most heavily contaminated soils. This work is funded by the EPA Healthy Communities Program and there are three undergraduate students actively involved in the project: Michael Banaitis, Peter Downham, and Charity West. They will present the results of the research at the National Soil Science Society of America meetings this fall in Seattle. Professor Langley-Turnbaugh's second research project focuses on the relationship between airborne particulate matter and asthma incidence in Maine. She is working with Professor Nancy Gordon (Chemistry) and Professor John Wise (USM's Center for Integrated and Applied Environmental Toxicology), and they are funded through

the Maine Space Grant Consortium. Two undergraduate students, Arynne Jalbert and Gemma Van Epps, will present their results at the National Society of Toxicology meetings in Baltimore. Gemma is also funded through a NASA undergraduate student fellowship.

The move recognizes that the teaching, research, and service activities of ESP are consistent with those of an applied science and fit better with the mission of ASET.

Professor Sanford is currently researching the effectiveness of stream buffer regulations in protecting water quality and managing streams. Two undergraduate students, Adam Piper and BJ Robbins, are assisting him in gathering data for a pilot study on stream buffers in Cumberland County, Maine, and he hopes to submit a grant to do related work in the northern forest. Professor Sanford also has a book in press on site plans and land use development, which should be published by Putney Press sometime this summer. Professor Sanford and Professor Wagner have signed a contract with John Wiley & Sons for a book titled, *Environmental Science: Active Learning Laboratories and Applied Problem Sets*. Professor Sanford also co-coordinates (with Professor Bob Kuech from the College of Education) a high school regional science bowl for northern New England. The fourth Science Bowl was held February 28, 2004, and hosted 95 students from Maine, New Hampshire, and Massachusetts.

Professor Wagner recently had his contract extended for the third year as a visiting associate professor of DES. Travis has been selected to head a panel discussion at the Association for the Study of Literature and the Environment's symposium in June on "Nature and Culture in the Northern Forest." Travis's panel will focus on the teaching of environmental literacy at various types of institutions of higher education. Travis's paper "Hazardous Waste: Evolution of National Environmental Problem," will be published in the *Journal of Policy History* in the fall of 2004. Travis is currently working on a grant proposal to study the Nova Scotia system for managing residential and industrial non-hazardous waste. This model program is a quasi-government effort that seeks to divert recoverable resources from the waste stream and simultaneously support area industries that use the diverted resources.

Professor Sharon D'Orsie is currently in her second year at USM, and is developing and implementing new courses in environmental safety and health. She was recently awarded a Faculty Senate Research Grant to initiate a research program focusing on linkages between indoor air quality and asthma. She is also coordinating the establishment of the new Department's external advisory board.

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Applied Medical Sciences

At the University of Southern Maine, the Department of Applied Medical Sciences (AMS) remains the only academic unit with a unique opportunity to serve science education from pre-college level to doctoral training. The National Science Foundation (NSF) which funded the ScienceCorps program, a collaborative project between AMS and the Foundation for Blood Research (FBR), is in its third year of operation. Under the supervision of AMS Professors Monroe Duboise and Stephen Pelsue, 10 fully-funded graduate fellows participate in teaching laboratory classes in molecular biology and immunology in rural high schools in Limestone, Caribou, Mars Hill, Millinocket, Oxford Hills, Katahdin, Skowhegan, Farmingdale, Waldoboro, and Oakland, as well as the Capitol Area School in Augusta.

The AMS Department shares a common mission with USM's Bioscience Research Institute of Southern Maine (BRISM) to establish the University as a center of research excellence.

As the AMS Department continues to grow since its formation in 1987, it now provides training opportunities to graduate and advanced undergraduate students in multi-disciplinary areas that range from immunology, molecular biology, virology, epidemiology to environmental toxicology. Currently, faculty serve as thesis mentors for 15 master of science students in applied immunology and molecular biology (AIM) and five doctoral students enrolled in the cooperative Ph.D. program administered through the University of Maine. In an effort to serve the constantly evolving need in education of students and the local community, the program has been fortunate to benefit from the enthusiastic participation of adjunct faculty members from local institutions, including

the Foundation for Blood Research, the Maine Medical Center Research Institute (MMCRI), and the biotechnology laboratories in the region.

The applied medical sciences faculty's research discoveries in breast cancer epidemiology, liver cancer biology, infectious diseases, autoimmune diseases, and environmental metal toxicology have recently been published in leading journals in their respective fields, such as the *British Journal of Cancer*, the *Journal of Immunology*, the *Journal of Autoimmunity Research*, and *Molecular and Cellular Biochemistry*. Faculty members have presented their research accomplishments regularly at national and international conferences, at annual meetings of professional societies as well as at seminars conducted at various universities and research institutes. In addition to involving graduate and undergraduate students, some of the faculty research has enlisted the participation of high school science teachers and their students.

The AMS Department shares a common mission with USM's Bioscience Research Institute of Southern Maine (BRISM) to establish the University as a center of research excellence. The joint effort of the Department and the Institute has led to the recent founding of a new USM Center of Integrated and Applied Environmental Toxicology (CIAET) research cluster. The Center, with AMS faculty John Wise and Doug Thompson serving as director and associate director, respectively, is a first of its kind in Maine. It includes several member laboratories from USM and other institutes inside and outside Maine, including Mt. Desert Laboratory, the University of New England (UNE), the Darling Center of Marine Science, and Dartmouth University. In another joint effort to promote research collaboration via scientific exchange, the Department and BRISM launched a new Biomedical Science Seminar Series at USM which includes invited speakers from USM, BRISM, and outside institutes such as Dartmouth

University, Colorado State University, and Yale University.

Current external grants total over \$3 million from funding agencies such as the National Institutes of Health (NIH), National Science Foundation (NSF), and NMSF have provided crucial support for the academic activities of the AMS faculty. Recent major grant applications have included an NIH *Science Education Partnership Award* in collaboration with FBR (\$0.75 M); an NSF *Graduate Fellowship* (\$1.9 M); an NSF *Math Science Partnership Teacher Institute* proposal in collaboration with FBR, USM's Lewiston-



Work being undertaken in one of the science laboratories in the new research wing.

Auburn College, and the Maine School of Science and Mathematics (\$4.9 M); and a North Pacific Research Board grant application on *Metal Toxicity in Bowhead Whale and Steller Sea Lion* (\$2.6 M).

Contributions of AMS faculty members to professional services cover a wide range of academic duties at USM and in various scientific and educational opportunities outside the University. The many committees and advisory boards they serve include institutional review boards at the Foundation for Blood Research and the University of New England, advisory boards of the Maine School of Science and Mathematics and the Center of Innovative Biomedical Research. The expertise of AMS faculty is often sought by scientific journals, such as *Oncology*, for manuscript review, as well as by funding agencies, such as NIH, NSF and the Fulbright Scholarship Program, for grant review.

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AMS Presents Research

Students, faculty, and staff from the Department of Applied Medical Sciences (AMS) presented two separate posters at the general poster session of the 2004 annual meeting of the American Society for the Advancement of Science in Seattle, Washington.



Microbiologist Gail Fletcher and high school teacher Regina Herrick

The first poster presented the *Maine Lobster Health Project: Connecting Academic Research Laboratories and High School Classrooms with Collaborative Biocomplexity Research*. The poster described the collaborative activities of a group of high school science teachers, AMS graduate students, research staff, and faculty that included Regina Herrick (Skowhegan Area High School), Luci Levesque (Capital Area Technical Center in Augusta), Marjorie Tennyson (Hall-Dale High School in Farmingdale), Gail Fletcher and Christine Tellarini (Western New England College in Springfield, Massachusetts), Karen D. Moulton (USM research associate), USM graduate students Elizabeth Richards, Allison Hopkins, Sonya Hawkins, Barry Larman, and Beth Hill, and S. Monroe Duboise (associate professor in AMS). This presentation illustrated that problems in biocomplexity research are rich in possibilities for interdisciplinary collaborations in research and science education.

The Maine ScienceCorps, a National Science Foundation-sponsored educational outreach effort of AMS and the Foundation for Blood Research, has been enriching laboratory-based bioscience

learning in rural high schools across Maine through the collaboration of master teachers, graduate student fellows, and university scientists since 2001. Among 11 participating high schools, some provide special opportunities in biotechnology education as part of the curriculum or as voluntary after school activities. Academic scientists and students at USM and Western New England College are currently engaged in a collaborative research project with teachers and students at three Maine high schools. This research interfaces with a developing research program at USM investigating lobster shell disease, a polymicrobial disease of ill-defined etiology that is characterized by degradation of the chitinous carapace of these economically important crustaceans. Epizootic lobster shell disease in southern New England and Long Island coastal waters in recent years has caused significant concern within the Maine lobster industry. Shell disease is a problem in biocomplexity involving complex microbial communities and myriad environmental factors that provide a rich framework for interdisciplinary scientific inquiry in the laboratory and the classroom.

The second poster presentation, *Maine ScienceCorps: Integrating Enrichment of High School Biological Sciences Education in Rural Maine with Graduate Biomedical Sciences Education* included Allison Hopkins, Stephen C. Pelsue, and S. Monroe Duboise. Professors Pelsue and Duboise are from the Department of Applied Medical Sciences. Biological science teachers in Maine's rural high schools are challenged by professional isolation, limited access to the scientific world beyond the classroom, and minimal laboratory resources.

Supported by the *NSF Graduate Teaching Fellows in K-12 Education Program*, USM immunology and molecular biology graduate students and faculty have collaborated with high school science teachers to provide laboratory-based active learning experiences. Laboratory experiences provided since 2001 by the ScienceCorps graduate student fellows were not possible

previously in rural classrooms. Ten ScienceCorps fellows, working in teams of two, deliver laboratory activities complete with engaging scenarios or case histories requiring equipment, setup, and follow-through with students and teachers. The individual labs include activities developed in collaboration with the Foundation for Blood Research and new labs devised by the graduate students in collaboration with the classroom professionals and critiqued by USM faculty. Labs present specific concepts in biomedical science, microbiology, immunology, molecular biology, or biotechnology in an accessible format. Specific feedback is sought from the involved classroom professionals following ScienceCorps visits to the classroom. Teachers have reported increased student enthusiasm for scientific learning and for consideration of scientific careers. Graduate students benefit by gaining direct teaching experience requiring communication of scientific information to a non-scientific audience.



Stephen Pelsue

The University of Southern Maine scientific community hopes to sustain the ScienceCorps program as an experience integrated into graduate bioscience education that benefits graduate student professional development while addressing critical science education needs in rural Maine.

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Software Used Throughout the World

Bruce MacLeod, professor of computer science at USM since 1986, took a sabbatical leave during the 2002-2003 academic year. His activities during this time included research work, grant proposals, and consulting projects, and focused on the development of software as well as outreach to local industry and research centers.



Bruce MacLeod at Farafenni research site in Gambia

Professor MacLeod has been instrumental in developing the HRS (Household Registration System) software system that allows health researchers and demographers to construct data monitoring systems for longitudinal studies of populations. His most recent version, written in the early 1990s, is in operation at a number of health research centers around the world, most notably in Africa. During the sabbatical, he worked closely with three major research centers to develop significant improvements to the software and presented a paper on his research and development efforts.

The British Medical Research Council has maintained one of the health research centers, the Farafenni research site in Gambia, since 1981. The research station chose the HRS software as the primary data system to test a malaria vaccine for both rural and urban populations. Because the HRS has been used primarily in rural settings and has not served as the founda-

tion for a vaccine trial, Professor MacLeod was asked to travel to West Africa to develop software support for monitoring more urban populations and performing vaccine trials. His work in this area resulted in significant additions to the capabilities of the HRS that is the focus of many research projects addressing health issues of Africans in urban settings, as well as intervention strategies that use vaccines. MacLeod's travel and development activities were supported by the British Medical Research Council.

MacLeod has also designed and developed the HRS software for a large, multi-year, urban health study conducted by the UERD research group at the University of Ouagadougou in Burkina Faso. The project resulted in the first Francophone version of the software as well as the first version to have Internet accessible data. Software prototypes were also developed for hand-held data entry. This project was supported by the Population Council in New York, which further engaged MacLeod as a consultant on developing software to automate the construction of data files for survival analysis and logistical regression routines.

The Hanoi School of Public Health in Vietnam is undertaking a multi-year research project on adolescent health and the effects of urbanization. MacLeod completely rewrote the HRS system to meet the requirements that the system support Internet access to the data, the ability to collect data with hand-held computers, and support for multiple database systems. MacLeod noted that "I spent considerable time working on the architecture of a new and much improved version of the HRS that takes into consideration recent developments in computer science research, such as application frameworks and multiple tiered software architectures." His work resulted in a very productive collaboration with the School that resulted in two software developers in Hanoi working to complete the system with some portions of the project already in use.

A paper, "Developing Technical Capacities for Community Health

Research in Africa," was presented at a workshop given by INDEPTH in Accra, Ghana, and was then turned into a proposal to the INDEPTH network. The INDEPTH NETWORK is an international network of field sites with continuous demographic evaluation of populations and their health in developing countries. The demographic surveillance system (DSS) sites generate population-based health and demographic data on a longitudinal basis, and constitute a critical alternative to the lack of population-based information in much of the developing world.



A young resident of Navronga, Ghana.

Grateful for the opportunity that a sabbatical leave gives a professor, MacLeod says, "The sabbatical release time was pivotal to my successful collaboration in these projects, giving me the extended time required for travel to health centers in Africa and Asia; time for work on the architecture issues of software development; and time for active participation in workshops and conferences overseas. In all, I was able to work with five different organizations on three continents on projects involving interesting computer science research and development, and contributing to important health research problems in the developing world."

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Computer Science Develops Assessment Process

The Department of Computer Science is making progress along several fronts. The Department possesses both the technology and will to exchange graduate courses between USM and the Computer Science Department at the University of Maine. This will help bring a combined Ph.D. program in computer science to fruition. The UNIX laboratory has been remodeled and new UNIX machines have been installed in the facility. The renovation created a much more attractive laboratory that is also more useful.

The Department has been engaged in developing methods of assessing the program and those efforts are starting to pay off. The accrediting agency for the computer science program is the Accreditation Board for Engineering and Technology (ABET). In order to be accredited, programs are required to do an assessment from a variety of stakeholder viewpoints. The Department has organized a Computer Science Advisory Committee made up of 10 leading technical people from a sample of local businesses. These advisors have made their own assessment of the program and have aided tremendously in generating a set of assessment tools.

There are now three assessment questionnaires that can be used as part of the process. The first instrument is for graduating seniors to evaluate the program they have just completed. The second is for graduates who graduated two to four years ago. Finally, the third questionnaire is for supervisors of graduates in the workplace. All three are anonymous, unless the student wants to give identifying information.

All three questionnaires have one set of questions in common. These are based on the objectives the Department has identified. The objectives, as articulated in the most recent accreditation self-study, are that graduates of the program:

- are able to read and understand professional papers written using mathematical notation and proof.
- have achieved nearly professional competence in at least one programming language and one operating system.

- have the ability to design and build complex software.
- have knowledge of a variety of programming languages and paradigms.
- will be able to make a technical presentation on topics either concerning their work or the work of others.
- must be aware of the social and ethical implications of the knowledge and tools they have mastered.

The first section of each questionnaire deals directly with these objectives. The questionnaire for graduating seniors concerns the experience they had in the Department and the confidence they feel in their preparation as they enter the outside world.

Graduating students evaluate how well they meet the above objectives, how well the classes and faculty aided in the achievement of the objectives, and how well the equipment and other factors enhanced their ability to achieve the objectives. The Department is also interested in why a student chose USM and whether or not they were happy with that choice.

The questionnaire sent to graduates of the program would evaluate the way they met the objectives in the workplace. At this point they should know how well they can write complex software, for example. The survey is also used to find out what kinds of software systems they are using to be sure that the program keeps abreast of what is happening in the workplace. There is ample room on this and the other questionnaires to write detailed comments on the success they have achieved and USM's contribution to that success.

The questionnaire sent to local businesses is for supervisors to evaluate employees who have graduated from the

program. These questionnaires are very short, only asking for the supervisor's evaluation of employees on the objectives defined for the program. They are also asked if they would hire other graduates of the program and for any comments they may have regarding USM.

In order to be sure the questionnaires remain anonymous, the Department first contacts the employer's office to let them know the nature of the questionnaire and why the information is important. It also provides an opportunity to give them the names of their employees who graduated from USM. If they agree to help, the



Students work in the recently renovated UNIX laboratory in the Science Building.

Department sends the questionnaires which are then distributed to the managers of the identified employees. Either the human resources person or the managers return the completed, anonymous questionnaires. Only employers who employ at least three graduates of the program are contacted in order to ensure that the identity of any one individual cannot be obtained from the questionnaires.

The faculty believes these efforts are what ABET wants and, more important, they will aid the Department in keeping the computer science program up-to-date and responsive to its students, graduates, and employers.

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The Promise of Education

Fariba Ghayebi has been living in Maine for approximately three years. She came to the state from Mashhad, Iran, where she grew up. She moved to Maine to study computer science at USM, and to join a family that has been here for 10 years. She left behind the difficulties of being a member of a minority religion, Baha'i, in a predominantly Muslim land.

At USM, and in Maine, she has found an interesting blend of differences and similarities, both in science and in culture. Fariba finds it amusing that so many of her American friends are surprised to find her so much like them. She considers herself quite ordinary. Getting used to a new culture, and speaking more English and less Persian was a challenging adjustment. Even though the culture and language barriers make a difficult course of study even more difficult, she feels at home in Maine and looks forward to a future here. She is happy that she can add diversity to campus life and culture.

Fariba thinks a lot about why science and technology are studied mostly by men, while women seem to gravitate more to the humanities. "I find it interesting that there are not more women studying computer science in America," says Fariba. "I don't know why that is." Fariba explains that to the Baha'i people, education is held in the highest regard, and the study of science is the most noble of all virtues because of the way it can improve living conditions for people in need. She sees that as a very humanitarian thing that should be very attractive to women.

Still early in her college career, Fariba has maintained a full load with courses such as differential and integral calculus, mathematics, structured problem solving-C++, algebra and discrete mathematics, algorithms in programming, and calculus. She has a love of spoken languages and the humanities. This bright young woman sees clearly that there are humanities to be found in the

sciences, and sciences in the humanities, and that true partnerships of all kinds are needed most of all. She wants, in some way, to let women know how satisfying it is to study and create new things through technology that will help the neediest people of the world. This, she believes, will benefit men and women in America, and around the world, especially in third world countries that have so many needs.

"Computers are a tool," she says. "I want to use them to contribute to some other branch of science or humanities." With a great deal of conviction, however, Fariba does not see herself working for a large corporation years down the road, but for "some nonprofit organization" that cannot afford the high technology it takes to help people in need. She is only a little concerned that some will see that as lacking in ambition, when it is her greatest ambition to make such a difference.



Fariba Ghayebi

Fariba's greatest challenge now, she believes, is that she lacks experience in the field. She would like to gain experience through a summer internship, or a job in the field of computer science in order to begin making choices about the direction she will take her future studies and career beyond graduation. An excellent student, she is a 2003/04 recipient of the Governor's Computer Science Scholarship that is given by Wright Express LLC. Fariba expects to graduate in 2006, or sooner if possible.

USM and UM Work Together

During the last 20 years the number of students taking the SAT exam who are interested in pursuing engineering degrees has decreased by 50 percent. In

Europe and Japan, 20 percent of college graduates earn bachelor of science degrees in engineering. In the U.S., only five percent of the bachelor of science degrees awarded are in engineering. These alarming statistics prompted a unique collaboration between two of Maine's state universities: the University of Southern Maine and the University of Maine.

Bonnie Stearns, director of Student Services for USM's School of Applied Science, Engineering, and Technology, and Chet Rock,

In-class presentations inform students about the many challenging opportunities for fulfilling and well-paying careers in engineering.

executive director of Outreach Initiatives at the University of Maine's College of Engineering, contacted middle and high school math and science teachers and offered to give in-class presentations to inform students about the many challenging opportunities for

fulfilling and well-paying careers in engineering. The presentation covers a variety of engineering majors, including those not offered by either USM or UMaine. The presentation also includes several teamwork activities for students and a question and answer period.

To date, the two representatives have met with approximately 500 students from 11 different high schools in the southern Maine region.

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JMC Construction

Construction on the addition to the John Mitchell Center on the Gorham campus is progressing. Cold weather has delayed progress slightly, but the tentative opening date is still scheduled for the fall semester of 2004.

On September 20, 2003, ASET hosted a special homecoming celebration that included the groundbreaking ceremonies for the new addition. USM President Richard Pattenaude, School of Applied Science, Engineering, and Technology Dean John Wright, Paul Edmonds, vice president Operations, National Semiconductor, and Kirk Pond, chairman, president and chief executive officer, Fairchild Semiconductor, all spoke at the event. The large crowd that attended the event included the building's namesake John Mitchell and his wife Majorie. The groundbreaking was followed by a reception.



USM President Pattenaude, Paul Edmonds, Kirk Pond, John Mitchell, and Kal Kotkas participate in the groundbreaking ceremony.

The actual excavation work on the 23,000 sq. ft. expansion began on October 20, 2003. The first concrete pour occurred on November 11. The ASET Web site contains pictures of all the events and can be located at www.usm.maine.edu/aset/news.

There is also a way to monitor the ongoing progress of the renovations. The Department of Facilities Management has installed a camera that takes a snapshot of the building every three seconds. The images can be accessed from the ASET Web site or by linking directly to <http://jmcconstruction.usm.maine.edu>.

In addition to adding several classrooms and laboratories to the JMC, the project includes renovation of several existing laboratories, the installation of new bathrooms and an elevator, and the overall upgrade of the facility in order to bring it up to code in terms of safety, air quality, and accessibility. Professor William Moore is working closely with the architects and the construction firm as ASET's representative to the project.

Construction by Former Students



Drew Canning, construction supervisor, and Tom Wright, co-owner of Wright-Ryan Construction, Inc.

The new John Mitchell Center construction project is being completed by Wright-Ryan Construction, Inc., a company owned by two former USM students. Tom Wright, (John Mitchell was his advisor) graduated from the Department of Technology, while John Ryan took pre-engineering courses at

USM before getting his engineering degree from the University of Washington.

Tom was in the construction business in 1973, prior to entering the University of Southern Maine. He continued working throughout his time at the University and, with some time out for student teaching at Portland High School and in England, kept his business growing. In 1984, Wright-Ryan Construction Inc. came into being.

One of their first large projects for the University was the new Ice Arena in Gorham, built in 1997. The project was completed in five months from the ground up and the company received an award for early completion. The company also built the Philippi Hall dormitory on the Gorham campus and is nearing completion of the top three floors of the Glickman Family Library on the Portland campus.

Today, Wright-Ryan employs 60 people and provides construction services in the residential and commercial markets throughout Maine. Other significant buildings constructed by the company have been the Lewiston District Courthouse, the Hilton Garden Inn in Auburn, the Maine Criminal Justice Academy in Vassalboro, the Bath Middle School, the Freeport Middle School, the Freeport High School Science Wing and Auditorium, the First Parish Church in Brunswick, and the Harlow Building on the AMHI Campus in Augusta.



Construction progresses on the first floor of the John Mitchell Center addition.

Active Year for Technology

The year has been a busy one for everyone in the Department of Technology.

First, building on the 2 + 2 agreements developed under the leadership of Professor William Moore, Professor John Marshall is developing pathways for transfer into a new concentration within the industrial technology degree program in "electro-mechanical systems technology." This exciting new offering will be available to traditional as well as transfer students and will serve the needs of local industry partners who need graduates with the types of skills students will develop in this option.

The Department has applied for a Libra Professorship for the 2004/2005 academic year to investigate the need for, and feasibility of offering a program in the area of construction management (CM). Such programs exist throughout the country and the increasing sophistication of managing complex construction projects has resulted in a high demand for graduates in this field. As part of the Libra Professorship, the

Department has been fortunate enough to retain Professor Hank Campbell of Illinois State University as a visiting Libra Professor. Professor Campbell is a well-established, national-level expert in CM program analysis, development, and accreditation.

Second, Professor John Zaner has been granted a sabbatical for the fall 2004 semester to enhance his expertise in advanced Web site development. Professor Zaner's sabbatical will enable him to continue his efforts in the development and delivery of information technology courses, which continue to be a very important and popular set of course offerings for the department. Web-related content is an important part of the Department's concentration in information and communications technology.

Third, faculty have been active in scholarship and service activities. Professor H. Fred Walker recently completed his second book, titled *Certified Quality Technician Handbook*, published by ASQ

Press. He has also recently been awarded a contract to co-author a book with Professor Bhisham Gupta of the USM Department of Mathematics and Statistics, titled *Applied Statistics for the Six Sigma Green Belt*. The book will also be published by ASQ Press. Professor Andrew Anderson recently had an article on the study of integrating new media content in higher education programs accepted for publication in the *Visual Communications Journal*. Professor Sharon D'Orsie was recently elected a director of the Downeast Industrial Hygiene Section of the American Industrial Hygiene Association. AIHA is a national group of safety and health professionals concerned with the recognition, evaluation, and control of chemical, physical, and biological hazards in the workplace and community. Professor John Marshall has been actively supporting a math/science mentoring program in the Scarborough school system designed to interest girls in pursuing careers and opportunities in math and science.

H. Fred Walker can be reached at hfwalker@usm.maine.edu

Safety Education Award

Albert Kirk, associate professor of Technology and the University of Southern Maine's director of Environmental Safety and Health, received the 2003 Safety Educator Award of the Maine Bureau of Labor Commission on Safety & Health in the Maine Workplace. The award was presented by Commissioner Laura Fortman of the Maine Department of Labor. Al received the award in recognition of his significant contributions and high level of commitment to the safety and health of Maine's youth and future labor force. It noted his efforts in spearheading the development of the environmental safety and health degree program at the University of Southern Maine. Professor Kirk has been the director of Environmental Safety and Health at USM since 1990. In 1977, he began to work on several new courses in the areas of



Albert Kirk providing an ergonomic assessment

safety and health that eventually became the environmental safety and health degree program.

In addition to his academic responsibilities, Al has primary responsibility for all the environmental safety and health needs for USM's three campuses. This

includes chemical inventories, radiation, hazardous waste streams, safety training, and issues of confined space. Other activities range from developing the Ice Arena evacuation procedure to comply with emergency response protocols due to the anhydrous ammonia used in the ice making process, to doing ergonomic evaluations and assessments for computer work stations. He is also responsible for life safety issues in dormitories and campus buildings which include emergency lighting, heat and fire detectors, fire suppression equipment, building occupancy, and building evacuation plans.

Al received his bachelor's degree from Tampa University and his M.S. from Northern Illinois University. He holds a SCT in college teaching from Murray State University. He is an OSHA certified trainer for general industry and serves as the USM chemical hygiene officer.

Albert Kirk can be reached at safety@usm.maine.edu

Graduate is Safety Leader in Maine

Daniel Cote began working for Maine Employers' Mutual Insurance Company (MEMIC) when the Portland, Maine-based company was formed in 1993. The company's origins were in response to the severe problems companies in Maine were having in obtaining workers' compensation insurance. He is MEMIC's senior vice president of Safety.

Dan is responsible for MEMIC's safety consulting and education, operating throughout New England. The primary goals of those services are to reduce the number and severity of injuries at a customer's workplace, as well as develop unique industry relationships. The company's hallmark is its commitment to workplace safety. Its success is impressive—Maine has seen an overall reduction in workplace injuries of 30 percent since MEMIC was formed. That success has made the company well-known in insurance circles nationwide for its innovative efforts in workplace safety.



Daniel Cote

Today, MEMIC is Maine's largest workers' compensation insurer, with a growing profile throughout the northeastern U.S. through its subsidiary, MEMIC Indemnity Company, based in Manchester, NH. MEMIC insures 22,000 employers and an estimated 200,000 workers.

Intending to be an industrial education teacher, Dan obtained his undergraduate degree from the University of Southern Maine in 1980. His academic experiences led him to pursue a master's degree in occupational safety from Illinois State University. After completing the degree in 1983, Dan taught safety at Illinois State before being recruited into the insurance industry by the USF&G company. He credits USF&G for teaching him the insurance business. In 1987 he was promoted to the position of loss control and audit manager where he was responsible for hiring, training, and managing loss control engineers and payroll auditors within Maine and New

Hampshire. In 1991 he worked out of the Baltimore, Maryland, headquarters while assuming the position of regional loss control manager, responsible for engineers across the southern and northeastern regions of the country.

Dan continues his education, attending the Wharton School's Executive Development Program in 2000, the University of Chicago's Graduate School of Business Corporate Strategy program in 2003, and is midway through his MBA studies. He remains actively involved in numerous professional and charitable organizations, serving as the board chair for the Southern Maine Chapter of the American Red Cross, former chair of the Camp Good News Planning Committee for Maine CEF, a chair of the Governor's Advisory Committee on Workplace Safety for State Employees, and a past chair of the Safety and Health committee for the American Association of State Compensation Insurance Funds (AAS-CIF).

Instrumental in initiating ASET's environmental safety and health program, he continues to be a highly active participant in the program. In addition to serving on the program's advisory board, he has taught several courses and is currently working on the development of a Web-based course.

Benefits of Cooperative Education

by Kenneth Hall, industrial technology student

Many college students, near the point of graduating, search classified ads and job placement agencies only to find employers are looking for applicants with on-the-job experiences. Cooperative education is an opportunity to gain the valuable on-the-job experience employers are looking for while attending school. The experience does not have to be directly related to your career goals; what is important is the exposure to professionalism and how skills and ideas are applied in the real world.

As a student majoring in industrial technology, I have been provided with the appropriate academic, technical, and professional courses needed for leadership positions in production and manufacturing. Fortunately, I was able to integrate classroom theory with practical, on-the-job experience by obtaining a co-op position at Binax, a local company that develops and manufactures medical

diagnostic tests. During the duration of my co-op experience, I completed the job requirements and duties that consisted of performing experiments and documenting results for one of the research programs. I was also responsible for performing quality assurance stability tests on some of the product lines and calibrating measurement equipment in the laboratory.

The exposure of working in an industrial environment and learning the policies and standards is an exceptional educational experience that will improve job opportunities after graduation. It can also help to make imperative decisions about your future by confirming or redirecting career endeavors. Bill Palin, Binax's vice president of Research and ASET's newly appointed ASET Executive Advisory Board member, agrees that co-op opportunities are important for a student's professional growth and that they also build positive relationships between institutions and the local business community. I am thankful for my co-op opportunity at Binax, knowing that I have grown professionally and will have on-the-job experiences and meaningful references when I enter the workforce after graduation.

Technology's Mr. Wizard

In one corner of the laboratory sits a machine that automatically picks up a bowling ball and then deposits it on a spiral track. When it completes the maneuver, a bowling pin at the top of the device spins to signify a successful cycle. In another section of the lab, a device sorts balls that are metallic from those that are non-metallic as they roll down a ramp. In both cases, the sorted balls are then deposited back into the ramp to begin the process again. The entire sequence is automated and the equipment is able to distinguish between the materials and properly sort them. In another area of the facility a device automatically sorts different size bolts and screws emerging from a vibrating bowl. Lights flash and buzzers sound, signifying the sorting operation is underway.

Automatically picking up balls, detecting materials, and sorting items are only a few of the problems students are challenged with in Professor John Marshall's Industrial Controls and Automation laboratory. Using electronic, hydraulic, and pneumatic power and control technology, the students build apparatus that represent the automation technol-

ogy that can be found in today's modern manufacturing and material handling companies. While the resulting automated devices often operate with a monotonous consistency, having a device that reliably handles the process is what Marshall seeks.



John Marshall

Watching him demonstrate the devices students have built in small teams is like being on a tour of a science and technology center. What is even more remarkable is that many of the programmable logic devices that students program to operate the various apparatus, the pneumatic devices they incorporate to do the manipulation, and the power supplies that

help it all operate have been donated, provided through grants, or obtained at highly reduced costs. Professor Marshall estimates he has, over the past five years, acquired over \$400,000 in grants, gifts, and donations enabling him to design and equip the state-of-the-art facility.

Not only is John Marshall an innovative and highly motivated University instructor, he has worked closely with area schools to help them develop technology-related instructional programs that use many of the electronic, pneumatic, and programmable logic control modules he has created. Teachers attend summer workshops to learn how to integrate the modules into high school programs and they build devices to take back to their schools and use in the classroom.

In addition to teaching power, control, and automation classes, John supervises interns for the Department of Technology. He works closely with many area companies to help arrange a valuable educational experience that can be beneficial to both the student and the company.

John Marshall can be reached at jmarshall@usm.maine.edu

ESP Student Wins National Award

Sarah Ferriter, a senior in environmental science and policy, recently was awarded a grant from the National Wildlife Federation's Campus Ecology Fellowship Program. The National Wildlife Federation's Web site states the "program offers a nationally recognized opportunity for undergraduate and graduate students to pursue their vision of an ecologically sustainable future. Through tangible projects to green their campuses and communities, Fellows gain practical experience in the conservation field and first-hand knowledge of the challenges and opportunities inherent in successful conservation efforts." Sarah's award is based on a project to establish a permanent fund supported by student fees to implement and maintain biodiesel use in USM's campus buses and to conduct a campus greenhouse gas audit.

Sarah is academically one of the top students in the program and has a strong interest in global environmental sustainability issues. She also is involved in local,



Sarah Ferriter

national, and global environmental issues and is an invaluable student ambassador for USM.

During the last school year, Sarah studied with the American Councils Teachers of Russia (ACTR) in St. Petersburg. She is trying to return to Russia this summer to study the environment around Lake Baikal with the Tahoe-Baikal Institute.

During an ESP internship last summer, Sarah studied the science and politics of climate change, air pollution, and public health at the Climate Institute in Washington, D.C. Currently, she is interning with the Greater Portland Council of Governments to help organize the 10th annual statewide "Commute Another Way Day" in Maine on June 9.

Following graduation, Sarah plans to go to graduate school to study international environmental policy and public health.

Accreditation Highlights Engineering

The fundamental mission of the Department of Engineering of the University of Southern Maine is:

...to provide a solid and complete engineering education built upon a foundation of mathematics, science, and liberal arts. As a unit within a comprehensive metropolitan university, the mission includes serving both traditional and non-traditional students who are diverse in academic background, age, and life experience. The mission includes being a technical resource to the community by linking the teaching, research, and public service capabilities of the Engineering Department with the needs of the industries, organizations, and institutions of southern Maine.

Times are changing for engineering at USM. Mary Kesseli retired in July after a long service in the Dean's office and Engineering Department. While Mary's services were appreciated and she will be missed by faculty, staff, and students, the Department is fortunate to have a competent and dedicated new administrative assistant in Kristen Beahm. She is excited about her work and is well liked by the students. In November, Professor Carlos Lück assumed the role of Department chair, allowing Professor James Smith to coordinate efforts to bring a new program in mechanical engineering to USM that is presently in its planning stages. As the Department anticipates a substantial growth in student population with the new program, several curricular and personnel measures are underway to strengthen and revitalize the operation.

The bachelor of science degree in electrical engineering (BSEE) has been accredited for 12 years. Early in the fall, the program had a very positive visit from representatives of the Accrediting Board for Engineering and Technology (ABET). It is expected that an official notification of renewal will be announced by ABET this coming summer. Early reports have indicated that the visiting team was pleased with the program and the direction the Department is pursuing, as captured by the mission statement. The accreditation work also led to a statement of objectives for the electrical engineering program. Graduates of the program: 1) are prepared to function as engineers in technologically intensive firms; 2) are prepared to succeed in graduate study; 3) are able to embrace risk and have confidence to master challenges; 4) recognize the need for constant learning and continue to learn in a variety of venues; 5) can transfer their engineering skills to different environments; 6) can communicate in writing and verbally, work and learn independently and on a team, and think and solve problems; and 7) have multicultural awareness and knowledge of contemporary issues and an understanding of the impact of engineering solutions in a global and societal context.

Given all that the Department does, students are the main focus. Last summer, three two-year scholarships sponsored by National Semiconductor were awarded to qualified junior students. The Department was very pleased to hear members of the accreditation visiting team commenting on how impressed they were with the student body. They stated that the students have a great sense

of ownership of the program, they are enthusiastic about the value of the education they are receiving, and are optimistic about their professional career upon graduating. They were also impressed by the level of support for the program, demonstrated by the southern Maine community in general and the program's advisory board in particular. The Department is thankful for the support and seeks to further engage existing and new individuals and companies. Individuals can contact the Department to find out more about available help. After all, the program belongs to the people in this state and the faculty and staff are honored to be its stewards.

Carlos Lück can be reached at luck@usm.maine.edu

ASET Executive Advisory Board

The ASET Executive Advisory Board serves to provide guidance to the School of Applied Science, Engineering, and Technology. It is comprised of individuals who have educational backgrounds, work experience, or are from companies or organizations that relate to the activities of the School.

Chairman of the Board

Joe Oldfield, *vice president and COO, Seabrook International, LLC*

Vice Chairman of the Board

Paul Edmonds, *vice president, Operations, National Semiconductor Corp.*

Board Members

Gary F. Crocker, *director of State and Federal Programs, Office of the President, Maine Community College System*

John Haggerty, *vice president, Human Resources, Barber Foods*

Philip A. Helgerson, *director, Applied Technology Center, Maine Dept. of Economic and Community Development*

W.R. Jackson Jr., *consultant*

John D. K. Karp, P.E., *senior project manager, Maine MEP*

Roger Lord, *Department of Technology Education, Gorham High School*

Kevin MacDonald, *quality manager, Pratt & Whitney*

Joseph Migliaccio, *technology specialist, Maine Technology Institute*

William J. Palin, Ph.D., *vice president, Research, Binax*

Scott W. Roberts, *senior vice president of Strategic Planning, Wright Express LLC*

Thomas Roeber, P.E., *engineering manager, Nichols Portland*

Roland Sutton, *chairman and CEO, Maine Machine Products Company*

Doug Wilson, *operations manager, Fairchild Semiconductor*

Michael Wing, *consultant, The Carleton-Group*

Hodgkin Leads Research Effort

Since leaving the position of dean of the School of Applied Science, Professor Brian Hodgkin has been instrumental in USM's efforts to expand its research programs. Hodgkin is currently serving as the associate director of Research Initiatives and director of the Biosciences Research Institute, after having served two years as a special assistant for research and development.

The Biosciences Research Institute is a unit within Research Initiatives, the USM organization that stimulates research campus wide. The Institute fosters research in the biosciences at USM and partner institutions that include the Foundation for Blood Research and Maine Medical Center Research Institute. It also has collaborations with Bowdoin College, Colby College, Jackson Laboratory, Mount Desert Island Biological Laboratory, State of Maine Bureau of Health, University of Maine, and the University of New England

The Institute brings together faculty researchers and staff from a number of academic programs at USM that include biology, chemistry, psychology, sports medicine, environmental science and policy, immunology and molecular biology, and the natural and applied sciences. A major purpose is to assist in attracting external funding for R&D in the biosciences by fostering small group collaborations as well as individual research. It is also designed to facilitate the participation of USM and affiliated faculty in delivering the University of Maine collaborative Ph.D. program with

emphasis in carcinogenesis and environmental toxicology. The Institute is home to the Bioethics Project, Center for Integrated and Applied Environmental Toxicology, and the Gulf of Maine Area Program.



Brian Hodgkin

The Institute is housed in the Research Wing of the Science Building on the Portland campus. Six research laboratories, three support facilities, and the animal care facility for rodents and fish are all operational. The laboratories include those equipped for research in environmental toxicology, immunology, developmental neurophysiology, and oceanography. One of the support facilities provides the capability to use radioactive isotopes in biological research, a first for USM. Counting laboratory assistants, postdoctoral fellows, gradu-

ate students, and office personnel, there are 40 people working in the Research Wing.

In addition to his research role, Professor Hodgkin remains a faculty member in the Department of Engineering and continues to teach courses in electrical engineering. He was the founding dean of what is now known as the School of Applied Science, Engineering, and Technology and served in that position from 1985 to 1999. Prior to coming to USM, Brian was a research associate at Maine Medical Center and served as a research instructor at Johns Hopkins University. He also was a visiting assistant professor in the Department of Physiology and Biophysics at Hahnemann Medical College.

Brian Hodgkin holds a baccalaureate in agricultural engineering and master's degree in electrical engineering from the University of Maine. His Ph.D. in biomedical engineering is from The Johns Hopkins University. Professor Hodgkin has published and done research on the impact of electric fields on humans, human perception thresholds for direct current, cardiographic characterization of myocardial infarction, myocardial performance, sudden infant death syndrome, hemorrhagic shock, mechanism of cardiopulmonary resuscitation, and paralytic shellfish poisoning. He has also served on the board of directors for the American Heart Association and the Maine Biological and Medical Sciences Symposium.

Brian Hodgkin can be reached at hodgkin@usm.maine.edu

EP Finds Solutions

The goal of External Programs (EP) is very simple: supporting people and organizations in moving from high potential to high performance. Manufacturers and businesses throughout Maine continue to search for specific talents and skill sets to improve their operation and bottom line. We've encountered many manufacturers in the last three months looking for new talent, refined skills, and higher levels of performance. In each case, EP has been able to help these individual companies invest in per-

sonnel by offering courses either at the University or on-site.

EP has been working as a partner with employers to build and refine new skills in the current work force. These investments have raised performance, reduced costs, and increased R.O.I. without adding new employees. The activities have included a short course in technical writing, focused training in quality, and programs to "train-the-trainer." Depending on the need, External Programs can help arrange the delivery of short courses or full-credit college-level courses. EP is currently conduct-

ing training and credit courses on-site with several employers and the results have been exceptional. With focused training, companies are able to see changes and realize very short turn-around times without the expense of hiring new talent.

Manufacturers throughout Maine are realizing that working in partnership with ASET can sustain and enhance their work force and be an asset to their growth and productivity.

Greg Bazinet can be reached at bazinet@usm.maine.edu

Accreditation

The University of Southern Maine's baccalaureate degree program in industrial technology recently was reaccredited by the National Association of Industrial Technology (NAIT). USM is one of only 51 baccalaureate programs in the nation accredited by NAIT—the only accrediting body for industrial technology programs—and the only educational institution in Maine to offer the degree.

In order to be accredited, the program must meet a series of standards that demonstrate a high level of faculty expertise, offer relevant curriculum, and include updated technology and equipment. The accreditation period lasts six years.

“Our reaccreditation validates that USM prepares students well to meet the changing demands of our industrial sector,” says John Wright, dean of the School of Applied Science, Engineering, and

Technology. “Manufacturing now needs people with a much higher level of technical knowledge. Low-skilled factory jobs are rapidly being replaced by smart machines and automation, or are being shipped offshore. USM is trying to provide advanced engineering and technology options that support existing industries, and encourage environmentally friendly industries to relocate or start up in Maine. It’s part of the puzzle of rethinking the Maine economy.”

The electrical engineering and computer science programs are also in the midst of accreditation. The Department of Engineering prepared their self-study this past year and had a visit by the Accrediting Board of Engineering and Technology (ABET) in the fall semester. The exit interview was positive and they should hear this summer regarding their accreditation status. The computer science program is preparing for a fall 2004 visit from a team from the computer science division

of the Accrediting Board of Engineering and Technology.

The accreditation process includes the preparation of a detailed self-study report that addresses how each program is performing with respect to the standards of the particular accrediting agency. The self-study supports its response to the standards by collecting and reporting on relevant data. The report is then sent to the accrediting agency. A team of experts from other universities and organizations visits the campus to validate the content of the self-study report. They then make a recommendation to the accrediting board, which then grants accreditation, non-accreditation, or requires that the institution make adjustments which are then verified with an additional visit. The actual accreditation is not awarded until the accrediting board of the association meets and acts upon the requests from institutions seeking accreditation.

Toxicology Center Established

USM scientist and Portland native John Wise, until recently an environmental toxicologist at Yale, likes to ask audiences if Maine really is the way life should be. Maine ranks first and fifth in the nation for bladder cancer deaths among females and males, respectively. Maine is also above the national average for lung and colorectal cancers, and has one of the highest rates of asthma-related deaths in New England. Arsenic, mercury, lead, and other metals are prevalent in Maine, and scientific findings have established direct links between these contaminants and many fatal diseases, including cancer and asthma.

Despite all this, Maine has been the only state in New England without a toxicology center for studying the effects of environmental contaminants on human health. Wise, a 1983 graduate of Portland High School, has changed that with the establishment of the USM Center for Integrated and Applied Environmental Toxicology (CIAET). The University of Maine System Board of Trustees approved the Center in September of 2003. External grants will cover the major costs associated with the center.

Wise serves as director, and with Deputy Director W. Douglas Thompson they plan to develop an internationally recognized research program that develops new knowledge about the causes and prevention of environmentally related diseases. In the process, they anticipate increases in the levels of biomedical research funding in Maine.

In the process, they anticipate increases in the levels of biomedical research funding in Maine.

Though the Center is headquartered in USM's new Bioscience Research Institute in Portland, it is a collaborative venture among research partners throughout Maine and New England. Wise already has recruited nearly 40 members at regional institutions, among them the University of Maine, the University of New England, Bates, the Maine Bureau of Health, Maine Medical Center, Colby, Dartmouth, Bowdoin, the Maine

Department of Agriculture, and the Foundation for Blood Research.

The Center's work builds upon the work of the research partners and Wise's research in USM's Laboratory for Environmental and Genetic Toxicology. Four new investigations into the toxic effects of metals of special concern in Maine are about to be launched by center members. These include three new studies of the toxic effects of arsenic being started by USM Professors Stephen Pelsue and Doug Currie, and Professor Ed Bilsky at UNE, along with one new study of the toxic effects of lead being undertaken by Professor Vince Markowski of USM. These new studies serve to complement exposure assessment studies of arsenic and lead in Maine already underway by Center member Dr. Andy Smith at the Maine Bureau of Health. The Wise lab uses cell culture models and state-of-the-art molecular and toxicological techniques to investigate the effects of metals and particulates on humans and marine animals.

Wise and Thompson serve as faculty in USM's School of Applied Science, Engineering, and Technology.

John Wise can be reached at john.wise@usm.maine.edu

Faculty and Staff Join ASET

The School of Applied Science, Engineering, and Technology is pleased to introduce several new faculty and staff. Associate Professor Samantha Langley-Turnbaugh, Associate Professor Robert Sanford, and Assistant Professor Travis Wagner are transferring to ASET from the College of Arts and Sciences. Therese Martin, the current administrative assistant in environmental science and policy will be the administrative assistant in the new Department of Environmental Science. Kristen Beahm is the new administrative assistant for the Department of Engineering, replacing Mary Kesseli, who recently retired.

Kristen Beahm

Kristen Beahm joined the School of Applied Science, Engineering and Technology as an administrative assistant for the Engineering Department in July 2003. Kristen has worked the past 2 1/2 years in the University of Southern Maine Police Department.



Kristen is currently a member of the Classified Staff Senate at USM and is the chair for the communication and technology committee of the Senate. Kristen is a graduate of Andover College with an associate's degree in office management.

Kristen lives in Westbrook with her husband, Jim, and their two sons, Jimmy and Christopher. Kristen

enjoys boat rides on Sebago, bike riding and cross-country skiing, working in her flower garden, and reading with her kids.

Kristen Beahm can be reached at kbeahm@usm.maine.edu

Samantha Langley-Turnbaugh

Samantha, a native of Kittery, received a B.S. in forest engineering from the University of Maine-Orono in 1987. She worked as an on-the-ground forest industry professional, having started as an intern with Scott Paper Co. during college. When she attended graduate school at the University of New Hampshire, she discovered both an affinity for teaching and scholarship and an interest in soil science. After completing an M.S. in soils at UNH, Samantha traveled to the University of Wisconsin-Madison to earn her Ph.D. in soil science, awarded in 1995.

Samantha's research interests include the role of soils and dust in triggering adult and childhood asthma, interactions between soil quality and vegetation health in urban and forest ecosystems, and applications of phytoremediation techniques in mitigating lead contamination in urban soils. Soil assessments in urban ecosystems will help identify knowledge gaps and enhance management of urban green space. She teach-



es courses in soils, land use, water conservation, bioremediation, phytoremediation, and forest ecology. Samantha will be the first chair of the new Department of Environmental Science in the School of Applied Science, Engineering, and Technology.

She has published on the topic of soils in *Soil Science*, *Journal of Environmental Quality*, and the *Journal of Soil and Water Conservation*.

Samantha Langley-Turnbaugh can be reached at langley@usm.maine.edu

Therese Martin

Therese has been at USM for 14 years, working for several departments, including Alumni, Professional Education, and Media Services. She joined the environmental science and policy program in 1998 because of her sincere interest in environmental issues and education. As Therese notes, "There is just so much to learn and get involved in to make a difference in this ever-changing world! We have a great group of students, faculty and staff here... we work really well together. I see us as a big family making a difference."

Therese is a Maine native, born in Portland. She received her A.A.S. in nutrition from Southern Maine Technical College. When Therese is not managing the various administrative affairs of ESP, she enjoys music, theatre, yoga, cooking, walking (especially the beach), old movies, and spending time with family and friends.

Therese Martin can be reached at theresem@usm.maine.edu

Robert Sanford

After completing two years of study in civil and environmental engineering at Clarkson University, Rob transferred to SUNY-Potsdam, where he received a bachelor of arts degree in anthropology in 1982. He earned his M.S. and Ph.D. from the SUNY College of Environmental Science and Forestry (ESF), after several years of conducting environmental impact assessments. Rob spent nine years as a district environmental board coordinator for Vermont's Act 250 land development law. In that capacity he administered a land-use permits program for one of nine districts in Vermont.

Rob has been an adjunct faculty member at SUNY-ESF, Community College of Vermont, Johnson State College, and Antioch New England Graduate School. He joined USM in 1996. He lives in Gorham with his wife and three children.

Rob teaches courses in environmental science, environmental impact assessment, planning, and natural resource policy. His gen-



eral research interests are in environmental planning, cultural resources management, natural resource and land use policy, and stream buffer protection. He is a board member of the Maine Environmental Education Association and is a Registered Professional Archaeologist.

He has published three books, four book chapters, and over 25 journal articles on environmental planning, environmental policy, and cultural resource management. He has authored over 25 environmental impact assessment reports. He recently published an article on evaluating the effectiveness of Act 250 in protecting Vermont streams for the *Journal of Environmental Planning and Management*. His books have been on the role of archeology in environmental assessments, and environmental planning.

Rob Sanford can be reached at rsanford@usm.maine.edu

Travis Wagner

Travis received his B.S. in environmental science at Unity College in Maine. His focus was wildlife management; however, his experiences with counting rabbit scat in the unorganized territory of Maine erased his grand ideas of a wildlife management career. Immediately following graduation, Travis accepted an internship with the U.S. Environmental Protection Agency's Office of Toxic Substances in Washington, D.C. He quickly found his niche—environmental policy and management. For the 14 years before Travis went to graduate school, he worked for a series of environmental firms focusing on a variety of environmental projects including solid and hazardous waste guidance and policy development; NEPA compliance; contaminated site remediation; pollution prevention; and hazardous waste regulatory compliance.



Travis has taught environmental policy and written and spoken about various aspects of waste management and pollution control. Since leaving Unity, he has lived in Washington, D.C.; Raleigh, N.C.; Wuerzburg, Germany; Kaiserslautern, Germany; and New Bern, N.C. Having become satiated with environmental consulting, and having relished his teaching experience, Travis decided to return fulltime to graduate school to fulfill his dream of teaching college. He received an M.P.P. in environmental policy from University of Maryland-College Park in 1998. In 2003, he obtained a Ph.D. in environmental and natural resources policy from George Washington University.

His research interests include comparative analysis of applied environmental policy with emphasis on pollution and waste; the socio-economic, legal, and political influences on the development and application of human and ecological risk assessment; and the historical development of environmental policy with emphasis on the role of scientific evidence. He has authored several publications, including *The Complete Guide to the Hazardous Waste Regulation*, *In Our Backyard: A Guide to Understanding Pollution and Its Effects* which was translated and published in Spanish in 1996 and in Arabic in 1997, *Hazardous Waste Identification and*

Classification Manual, and *The Hazardous Waste Q&A: An In depth Guide to The Resource Conservation and Recovery Act and The Hazardous Materials Transportation Act*. Travis is teaching courses in environmental science, environmental communications, pollution, and risk assessment and management.

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U.S. Senator Susan Collins at the 2004 Northern New England Science Bowl at USM

Tenure and Promotions

Dean John Wright recently announced the following tenure and promotion awards for faculty in ASET.

John Wise was awarded tenure at the rank of associate professor of toxicology and molecular epidemiology.

Andrew Anderson was promoted to the rank of professor in the Department of Technology.

New Department Chairs

In November of 2003, **Carlos Lück** was selected to be the new chair of the Department of Engineering. Lück assumes the position previously held by Professor James Smith. In addition to his teaching responsibilities, Smith is coordinating an effort to start a new mechanical engineering for USM.

Samantha Langley-Turnbaugh will serve as chair of the newly formed Department of Environmental Science.

Awards

ASET laboratory associate **Scott Dunbar** is the 2004 recipient of the Nelson & Small Prize. Dunbar was selected for his outstanding support to engineering students in their projects and studies. The Nelson & Small Company of Portland endowed the award in 1986 to honor a deserving employee for special contributions to the USM electrical engineering program, and to stimulate its continued development.

USM Grows

On June 2, 2003, Governor Baldacci cut the ribbon to inaugurate the opening of the Research Wing of the Science Building on the Portland campus. On June 10, 2003, the voters of Maine approved a bond issue that includes funds that will enable the building to expand to its design height of six levels. Construction of the additional three levels began in March 2004. Phase one includes state-of-the-art bioscience research laboratories and infrastructure. Phase two will enable growth of research in the biosciences and other areas.

ASET faculty are deeply involved in the building. Applied Medical Sciences faculty Monroe Dubiose, Ah-Kau Ng, Stephen Pelsue, John Wise, and Doug Thompson are conducting research in the new facilities. In their research administration roles, engineering faculty Julie Ellis and Brian Hodgkin have offices in the building. Professor Ellis is director of Research Initiatives and has responsibility for research development campus wide. Professor Hodgkin is director of the Bioscience Research Institute, which includes 25 faculty in three colleges.

Research Initiatives encourages collaborative research, increasingly necessary not only at a university such as USM but also in the larger research world. Three bioscience themes have been identified—environmental toxicology, aquatic systems, and neuroscience and cell signaling. Under the direction of Professor Wise, a Center for Integrated and Applied Environmental Toxicology has been created. It includes 14 USM faculty from 7 departments—Applied Medical Sciences, Biology, Chemistry, Environmental Science and Policy, Lewiston-Auburn, Philosophy, and Psychology

—as well as several members from outside the University. With this broad range of expertise, the group can address the multifaceted issues—biological, epidemiological, environmental, chemical, etc.—around such substances as arsenic and chromium in our environment.

A task force has developed strategic plans for effective and efficient use of the entire Science Building, plans that will enable it to grow and to integrate both the educational and the research enterprises in the natural and applied sciences at USM. Huge challenges remain. While the bond provided for expansion of the building upward, it did not provide sufficient funds to complete laboratories within. The University is aggressively fundraising from several sources to do this.



New Research Wing

In other construction activity, the top three floors of the Glickman Family Library on the Portland campus have been completed. Work continues on the Joel and Linda Abromson Community Education Center. The project includes a new, 1,200-car parking garage on the Portland campus that is now open. Construction has started on the Center's classroom/office building and the

500-seat Hannaford Lecture Hall. Plans call for the lecture hall and classroom building to be attached to the parking garage and include an enclosed pedestrian bridge that will cross Bedford Street and exit between Luther Bonney and Masterton Hall.

The University is also in the midst of installing wireless network access in all of its academic buildings. The Science Building on the Portland campus is one of the first buildings to be equipped with wireless networking. Tests are now being conducted in anticipation of having most of academic buildings operational for the start of the 2004-05 school year.



Construction of the new entrance to the John Mitchell Center.

**View construction progress by visiting:
<http://jmccconstruction.usm.maine.edu>**

National Semiconductor Scholarships

Three ASET students were selected in August of 2003 to receive National Semiconductor scholarships of \$10,000 to defray the costs of their junior and senior years in electrical engineering at USM. These scholarships, given by the National Semiconductor Foundation, demonstrate the strong relationship that USM's engineering program has with high tech industry in the greater Portland area.

"We designed these scholarships to increase the number of electrical engineering graduates in southern Maine and thereby contribute to the economic development of the region," says Anne Gauthier, National's Public Affairs manager. "Quality engineering education is critical to National's on-going success. National is proud to provide scholarships for USM engineering students. We are committed to USM's cooperative education program and to hiring USM engineering graduates. We encourage other companies to establish scholarships for students. Congratulations to our USM scholarship recipients."

Anya Cornell, now residing in Portland with her husband Paul, hails from St. Petersburg, Russia. She transferred to USM from the University of Massachusetts, and expects to graduate with a bachelor's in electrical engineering in May of 2005.

Nathaniel G. Huber transferred from Amherst College in Massachusetts, and resides in Falmouth, Maine, with his wife, Amanda. Huber is a member of the local student chapter of the IEEE (Institute of Electrical and Electronics Engineers). Prior to receiving the award, Huber had begun a co-op assignment at National.

Tho Thi Snow and her husband, Victor Snow, reside in Buxton. In addition to Snow's studies, she is a tutor of math at the Learning Center on the Gorham campus.

All three of these scholarship recipients appear on the dean's list each semester, consistently producing high quality work. It has become apparent to the industrial community in Maine that the development of students like these for a new high tech workforce is crucial to the economic development in the state. Many of ASET's students are enrolled in degree programs while already working to support homes and families. While it is certain that these talented and hard-working individuals will complete their studies, scholarships make a tremendous difference in how long it might take to get them into the workforce.

Scholarships, internships, and careers for ASET graduates are just some of the ways that local companies and organizations are currently involved in supporting education. In this economic climate, such support is regarded as further evidence of the positive view that local industry has of USM programs and the quality of its students. There are several other ASET scholarship donors including Wright Express LLC, Time Warner of Maine, Northern Utilities, Independent Order of Odd Fellows, and Southworth International.

MAC "Intouch" With Industry

The Manufacturing Applications Center (MAC) is growing. The Center is over a year old and provides services for Maine industries, including the delivery of several training courses to local industries in the areas of ergonomics—train-the-trainer, LEAN manufacturing, automated material processing, metal working/CNC, fundamentals of quality, industrial safety which includes the 30 hours' OSHA certification, and basic machining principles. Some of the companies that have received the training include IDEXX Laboratories, American Tool, Rich Tool & Die, and Architectural Skylight.



What caption goes here?

The testing laboratory has seen a lot of activity. Companies such as Saunders Bros., CMP, Thos. Moser, Saco Plastics, Kady International, Remstar, along with the State of Maine Bureau of Purchasing have submitted products for testing and examination. Destructive and non-destructive testing and product failure analysis examinations for insurance companies, local industries, and attorneys have occupied much of the Center's time.

The funds derived from the services provided by MAC supports the Center as well as provides resources that benefit various ASET programs. The benefits include bringing real-world problems into the academic environment in a way that is highly beneficial to faculty and students in a variety of courses.

MAC is looking forward to a new laboratory which is now in the construction phase as a result of the John Mitchell Center expansion project. This new lab will not only be larger but will enable MAC to expand its existing capabilities to include a new 8x20 foot concrete testing platform with anchors and a 10,000 pound lifting overhead crane will add a new destructive testing component to the lab. In addition, a new 120,000 pound universal testing machine will expand capacities as well.

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Recognition

This year, the School of Applied Science, Engineering, and Technology recognized at their annual banquet several of its outstanding students and graduates.

Scholarships

Lawrence N. Cilley

Michal J. Slawiec

Brian C. Hodgkin

Philip W. Schmidt

Hollis W. Moore

Karl T. Clapp

Independent Order of Odd Fellows

Christopher M. Towns

L. L. Bean

Bonnie A. Best

Weston A. Watts, Jr.

National Semiconductor Foundation

Anya B. Cornell

Tho T. Snow

Nathaniel G. Huber

New England Association of Technology

Educators/Arthur Furstain Scholarship

Samuel C. Blunda

Northern Utilities

Joanne C. Lester

Clifford A. Parsons

Melissa White

Society of Manufacturing Engineers

Kevin M. Hanscom

Southworth International Scholarship

William R. Grigorets

Time Warner Scholarship

Christopher A. Mooney

Wright Express/Governor's

Computer Science

Mark A. Bray

Chase N. Colburn

Fariba Ghayebi

Christopher A. Mooney

Charles D. Paradis

Outstanding Student Awards

This award, given by the faculty of each department, recognizes a graduating senior who has had an exemplary academic career.

Applied Medical Science

Elizabeth M. Richards

Computer Science

Keith B. Marple (undergraduate)

Robert W. Rowan (graduate)

Engineering

Keith A. Johnson

Technology

Jamie L. Andrews (undergraduate)

Stephanie E. Renaud (graduate)

Outstanding Alumni Awards

These awards recognize individuals who have graduated from ASET degree programs and have since distinguished themselves in terms of career, service, education, and/or recognition.

Applied Medical Science

Andre L. Albert

Computer Science

Stephen A. Houser

Engineering

Jason B. Woloszyn

Technology

Daniel S. Cote



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Engineering, and Technology

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