



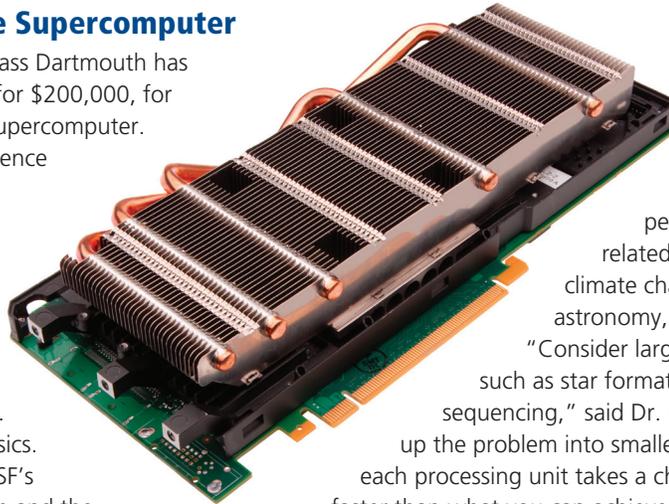
UMass Dartmouth to Acquire Supercomputer

The College of Engineering at UMass Dartmouth has been awarded two grants, each for \$200,000, for the purchase of a cutting-edge supercomputer.

The grants, from the National Science Foundation and the Air Force Office of Scientific Research, will significantly increase the College's research capacity through the addition of this new, \$400,000 computer.

"This new supercomputer will boost the capabilities of researchers at UMass Dartmouth enormously," said Dr. Robert Fisher, Assistant Professor of Physics. The funds were awarded through the NSF's Major Research Instrumentation Program and the Air Force's Defense University Research Instrumentation Program. Dr. Fisher led a multidisciplinary team of computational science, mathematics, and engineering faculty who won this grant. The team included Dr. Sigal Gottlieb, Professor of Mathematics, Dr. Medhi Raessi, Assistant Professor of Mechanical Engineering, Dr. Geoffrey Cowles, Assistant Professor at SMAST, and Dr. Cheng Wang, Assistant Professor of Mathematics.

This high-performance supercomputer, comprised of a cluster of linked computers, will be used to address large computational problems in quantum and astrophysics, applied mathematics, oceanography, and materials science. "We will be able to do calculations here that were previously only capable at national supercomputer centers."



Faculty and student researchers will use the new computer to model complex phenomena, conduct numerical experiments, expand interdisciplinary research and perform state-of-the-art simulations related to medicine, the environment, climate change, computational biology, astronomy, economics, and national security.

"Consider large computational problems, such as star formation, data analysis, or genome sequencing," said Dr. Fisher. "The computer will break up the problem into smaller, more manageable chunks, and each processing unit takes a chunk. It will be thousands of times faster than what you can achieve on a single desktop."

What differentiates this supercomputer from other high-performance computers is the power of its GPUs, (graphics processing units.) "Entertainment industry demands for high-end graphics processing has driven the advancement for the technology of GPUs," Dr. Fisher explains, "This supercomputer has 80 M2050 Tesla GPU computing modules. Instead of powering video games or graphics visualizations, these GPUs will enhance problem-solving capabilities to speeds previously unimagined. A single GPU in a computer has 50 times more raw computing power than a traditional brain or central processing unit."

The power and potential of GPUs allows researchers to conduct more complex analyses and devise larger, more efficient numerical and computational methods. Fisher notes that "we are going

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Congressional Fellowship Awarded to Mechanical Engineering Professor

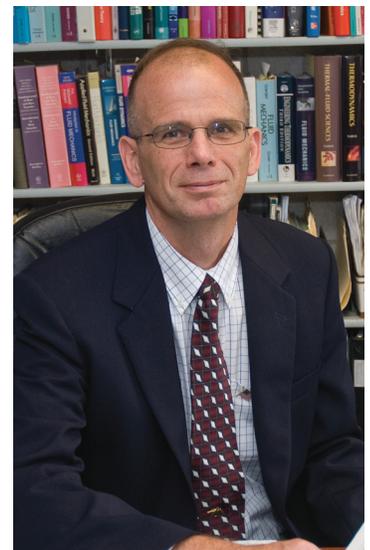
Peter Friedman, Associate Professor of Mechanical Engineering, is preparing for an exceptional year on Capitol Hill, meeting with government officials and participating in committee meetings and round table discussions on energy policy issues.

Dr. Friedman's colleagues at the American Society of Mechanical Engineers (ASME) selected him to receive this congressional fellowship for 2011. Professors chosen participate directly in the lawmaking process and learn how federal government policies affect energy equations. Congress, in turn, benefits from the engineering expertise of the academic community.

Dr. Friedman wants to make a contribution to "a rational science-based energy policy that not only addresses the near-term shortages, but also moves toward long-term sustainability." A member of ASME since 1995, he hopes to be assigned to a Senator serving on the Energy & Natural Resources Committee.

"I'm an engineering professor, but engineering does not exist in a vacuum; it's tied into policy decisions that have to be made. This fellowship will help me become more aware of how policy implications affect the field."

Dr. Friedman's specific interest is in nuclear power. He hopes to play a role in reviving interest and developing a national policy for nuclear energy. "Nuclear power is one of the nation's highest



Message from the Dean



Dear Alumni and Friends,

Welcome to the College of Engineering newsletter. We are delighted to share with you the enthusiasm and success stories of our students, faculty and alumni.

The College is maintaining a trajectory of growth and excellence as we start the 2011 school year. We have a diverse enrollment of 1,000 undergraduate and 300 graduate students. During the last fiscal year, our faculty garnered over \$2 million in research grants in such areas as biomaterials, sustainability engineering, intelligent systems, and marine technologies.

Our engineering and computer science programs are nationally accredited by ABET and *US News & World Report* has again ranked the College of Engineering in the top 50 undergraduate engineering programs among our peer institutions. This ranking is a testament to our fine students and to the commitment by an outstanding faculty and staff to provide quality educational programs.

I want to extend a personal invitation to alumni and friends to become more involved in the college. We offer opportunities to support graduate and undergraduate research, internships and senior capstone projects. If you are interested in recruiting engineering students for your company, please contact Debra Raposa in the Dean's office at 508.999.8387 or draposa@umassd.edu.

We hope you enjoy this newsletter and will explore more college activities at www.umassd.edu/engineering/coe/. We welcome your news or feedback at coe@umassd.edu.

Sincerely,

Robert E. Peck, Ph.D.
Dean, College of Engineering

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to have the best of both worlds: powerful individual units working together to solve problems combined with the speed of these graphics processing units. Other institutions are using GPUs, but very few focus on high-performance computation."

The design and technology of this supercomputer is similar to a Chinese unit rated as the world's second most powerful. Dr. Fisher clarifies that "in terms of scientific computation, we're really at the vanguard in terms of that part of the high-performance machine world."

According to Dr. Fisher, the broader impact of this machine extends beyond high-performance computations. "This will be the way

of the future for the next generation of students in high-performance computing." The success and recognition of this system, utilizing GPUs, could lead to developing cluster technology scaled down onto small systems or even single desktops. This supercomputer is a starting point toward providing the advanced technology that will enable larger, faster computations on all levels.

The supercomputer will be installed and running in time for the spring 2011 semester. An Internal Advisory Board will help guide the use of the shared facility, utilizing a separate internet connection and access through special terminals.

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priorities. If we want clean, environmentally friendly energy, nuclear has to be part of the solution."

He believes public apprehension and stagnated policy making stem from safety concerns and lack of education over just how small an environmental footprint nuclear power really leaves. "Nuclear power is the safest compared to other forms of energy, based on number of fatalities per quantity of energy produced, and that even includes Chernobyl." He also notes that, contrary to public opinion, the amount of high-level waste produced from nuclear power is extraordinarily small. All the nuclear waste ever produced in the United States can be stacked seven yards high on a football field.

While he believes in the benefits of increased renewable energy, he also sees its restrictions. "I think renewable energy can be part of the equation, but only to a point. There are very real limitations to the amount of renewable energy you can put on the grid. Certainly, we should use it where we can. Nuclear waste should be reprocessed to provide fuel, extracting the residual energy and reducing the amount of waste."

Peter Friedman has been a professor at UMass Dartmouth since 2002. Before earning his PhD in Mechanical Engineering from Johns Hopkins University, Dr. Friedman had a distinguished career as a submarine officer. During his Navy Career he was awarded the Meritorious Service Medal, two Navy Commendation Medals and two Navy Achievement Medals.

Faculty News

Professors K. Srinagesh (MNE), C.H. Chen (ECE), and Richard Upchurch (CIS) all retired in 2010 after many years of dedicated service. Congratulations are extended to professors Iren Valova (CIS), Qinquo Fan (MTX), and Amit Tandon (PHY) who were promoted to full professor and professor Vinod Vokkarane who was promoted to associate professor with tenure. New faculty last year were professors Chi Keung (Ken) Lee (CIS) and Hongang (Bill) Wang (ECE).

Physics Alumnus Wins Presidential Teaching Award Fall 2010

Jeffrey Schoonover '94 Physics, '99 MS Physics, a science teacher at Portsmouth (RI) High School and summer Physics Professor At UMass Dartmouth, is among 103 teachers around the nation chosen by President Obama to receive the 2010 Presidential Award for Excellence in Mathematics and Science Teaching. Each year, the award is presented to the best K-12 science and mathematics teachers across the country. Winners receive \$10,000 from the National Science Foundation and an all expenses paid trip to Washington, D.C. for an awards ceremony with the President, and several days of educational events, including visits with members of Congress and science agency leaders

"I am fortunate to have been surrounded by excellent teachers and supportive administrations since becoming a teacher," said Schoonover upon learning of his award. Schoonover has been a science teacher for fifteen, the last ten at Portsmouth High School, where he chairs the Science Department. During that time, he has taken a leadership role in improving



and expanding the science curriculum. He interacts with students, parents, faculty, the Rhode Island school system, and his local community. His achievements include establishing the Physics First program at his school, working to integrate modern technology into classrooms, piloting a



IN MEMORIAM Boleslaw Mikolajczak

The college lost a respected colleague and friend when Professor Boleslaw Mikolajczak passed away on July 22, 2010. Born and educated in Poland, Professor Mikolajczak joined the computer science department at UMass Dartmouth in 1986. He was an outstanding scholar and educator in theoretical computer science and was recognized internationally for his

research in Petri Nets. While serving as department chair for the past 15 years he was instrumental in building a leading computer science program with accomplished students and faculty. He is remembered for his leadership, fairness, dedication to the profession, and his firmly-held principles about academic life. Donations in his memory may be made to UMDF/Mikolajczak Fund, c/o University of Massachusetts Foundation Office.

National Science Foundation program using computer models to teach about atoms and molecules, organizing his school's annual science fair, and expanding the advanced placement science curriculum.

Schoonover is especially proud of the Physics First program, launched five years ago. It reverses the standard high school science sequence, biology-chemistry-physics, by starting freshmen with physics, followed by chemistry in the tenth grade and biology in the eleventh. The entry level physics course relies on simple concepts and pre-algebra/algebra 1 math skills. By starting with physics, students are able to better comprehend physics-related content in subsequent chemistry and biology classes. "Historically, it's been biology, chemistry, and then physics since the late 1800s. In that time so much has changed...there are different types of biology—molecular, cellular—that require an understanding of chemistry. And before you talk about atoms and molecules in chemistry, students need to understand the nature of forces and electromagnetism. Physics provides foundations for both," said Mr. Schoonover.

After completing the freshman course, seniors are eligible to take advanced level physics. The Physics First program has doubled the number of students taking

advanced placement science classes at Portsmouth High. "I've been very active in bringing the Physics First program to other schools; it's a model that really works," said Schoonover, who has taught physics classes to other physics teachers responsible for implementing the Physics First curriculum in their schools.

Schoonover has been teaching part-time at UMD during the summer since 2000. Since first stepping on the campus in 1994 Schoonover admits he's always felt

"I've been very active in bringing the Physics First program to other schools; it's a model that really works."

—Jeffrey Schoonover

a strong connection with the University. "I like keeping busy and I enjoy being here." Though extremely dedicated and respected by the University's Physics Department, Mr. Schoonover is reluctant to give up his high school career. "It's a little late in life for me to get my Ph.D. and, with three kids; it's difficult to give up my full-time job. Besides, I like what I'm doing."



Students study fundamental drinking water treatment processes and attempt to reduce microbial counts in pond water.



(left) Students assemble robots that mimic the behavior and motion of roaches.

(below) A student conducts a bending test on a loaded beam structure by measuring its deflection.

Freshman Summer Institute Demonstrates Continued Success

Inside Woodland Commons, incoming freshman conclude the College of Engineering's Freshman Summer Institute with poster presentations for parents, faculty, and colleagues describing their week-long engineering projects.

One project involved artificial intelligence and using line and light sensors to get a small robot to simulate the behavior of roaches looking for food. Flashing a light on its sensor gets the robot to follow, with the ultimate goal of leading it onto a black line enclosing all of a square mat, then getting it to perform an entire revolution.

Another group played a computer file of an audio recording created through speech synthesis. "This is a very enthusiastic environment. I'm glad to be getting my brain working again. This is a warm-up for me so I will know what to expect," said Leo Makowski, from the speech synthesis group.

"I'm interested in the structural part of civil engineering—building bridges, highways, and stuff like that. This is more environmental, but I like it. I like helping people and figuring out how to make things better," said Joe Teixeira, who

worked in the Civil & Environmental Engineering Lab performing a series of treatment processes on campus pond water to make it palatable.

Other projects included calculating the moves, strategies and odds of winning in computerized checkers, determining the strength, flexibility, and stress points of

"I'm interested in the structural part of civil engineering—building bridges, highways, and stuff like that. This is more environmental, but I like it."

—Joe Teixeira

wood when applying weight and pressure and creating a time delay burglar alarm with circuit boards.

The College's Freshman Summer Institute is now in its ninth year. Students live on campus for a week, taking classes and working on projects and in laboratories

to prepare for university life. "This whole week was fun and helpful. It gave me a much better idea of the classes and what's on campus," said Chris Furtado, who worked in the Civil & Environmental Engineering Lab.

The cost is \$300 per student, with the university covering the room, board and academic costs. "The goal is to help students make the transition from high school to university life and to understand the intensity of assignments, teamwork, and management skills. We don't want them to be surprised by the work and lives they'll have here," said Dr. Tesfay Meressi, Associate Dean With the Summer Institute, he notes that "these students are already ahead of the game."

Each of the seven student group was assigned an individual engineering project as an introduction to the engineering curriculum. "All of this has been pretty useful; it's given me a good idea of what college life will be like," said Brendan Revane, who utilized phonetic transcription and speech synthesis to recreate a poem. "It doesn't hurt students to be exposed to this new knowledge since they haven't yet declared a major," said Karen

Payton, Professor in Electrical & Computer Engineering, who taught the speech synthesis project.

The program also included alumni guest speakers who provided insights into the industries these students will enter. "Having a fundamental engineering degree gives you the key to other professions and skills. You will probably work outside your trained engineering degree as much as in it," said Norman Bessette, ME '90, Senior Vice President of Engineering and Chief Technology Officer at Acumentrics, a power generation company.

Bessette's sound advice was to get practical experience through internships or summer jobs. "When you get out of school, you'll need to have something that will separate you from all the other resumes that slide onto my desk." He advised students to learn public speaking, fundamentals of business, and technical writing. "Don't lose sight of the fact that it is not all science and math." He also encouraged them to pay attention to off-discipline engineering courses. "How you manage time determines your success."

Pamela Lisiewicz, EE '80, Associate Director for Command Operations at Naval

Undersea Warfare Center in Newport, spoke about civilian opportunities in the Navy and the different technical areas in which scientists and engineers work. She noted that "The role of the Navy is freedom on the sea and protection from its enemies." She reviewed some of NUWC's contributions to submarine warfare, surface ships, research and development, and commercial shipping. "Global commerce is linked to maritime security. The world economy depends on its oceans' highways," she said.

Lisiewicz also gave a video presentation highlighting NUWC's state-of-the-art Virtual World Technology, used for 3D modeling and simulations, virtual conferences, and full remote access and control to hardware. The students were very impressed with what she described as "half a million acres on twenty thousand servers."

Students also heard from Faith Ball, Senior Engineering Manager at Lockheed Martin Sippican, Inc., headquartered in nearby Marion. She shared her own extensive engineering experience with FSI participants and described some of the rewarding career opportunities available to engineering graduates at Lockheed



Martin and other high-tech companies, She also outlined some of the interdisciplinary projects carried out by Lockheed Martin engineers and emphasized the importance of team work and communications skills.

FSI students were in high spirits at the end of the week over their choice in university and college. "The learning opportunities here go well beyond the classroom; the positive experiences here enrich higher education at the university," said Dr. Robert Peck, Dean of the College of Engineering.



Hard-Luck and Perseverance from the Inventor of Golden Shellback

Two years ago Sid Martin, Director of Technology at the Northeast Maritime Institute (NMI) in Fairhaven, received national attention when he dunked a Blackberry and an iPod into an aquarium on NBC's *The Today Show*, only to pull them out minutes later intact and fully functional. He and his engineering team at NMI had created Golden Shellback, a waterproof coating that can be applied to surfaces at the molecular level, regardless of the size and shape of the device.

GS was designed with maritime interests in mind; splash-proofing GPS tracking devices, communications equipment, and other electronic devices for mariners.

Within a few days, *The Today Show* footage appeared on major video sites, including Yahoo and YouTube. The company was inundated with calls, forcing them to shut down their phone lines. The Department of Defense even invited Mr. Martin to Washington for a demonstration.

Martin '81, who received both his Bachelor's and Master's in Electrical Engineering from UMass Dartmouth, seemed poised to become the classic inventor-has-breakthrough-and-gets-millions story. But, things did not work out quite that way.

"The past two years have been interesting from the viewpoint of things

you don't learn from school or from being an engineer. If you have a good idea, it doesn't always mean people will flock to it.

"We got the media attention before we got the product nailed," Martin admitted. He currently has three patents pending, but many of the industries and companies expected to jump at the chance to buy GS ended up turning him down. "People are still reluctant to accept that electronics can get wet but still survive," he said.

Cell Phone manufacturers and other electronics companies were reluctant to invest in the product because revenue from warranties and replacement sales would decline. Martin noted that "without the phone companies, it has been hard to get other equipment makers interested."

The demonstration with the Department of Defense was successful, but Martin learned that "DOD does not fund new businesses. It was an unexpected hurdle. They wanted us to come back as part of another product." Meeting the Department's product testing requirements costs \$80,000 or more and Martin decided against this investment without a guaranteed return. He now believes business with DOD will come "later rather than sooner."

The experience has not been all hardship and disappointment. Martin is currently

negotiating with a company that markets similar protection for cell phones, iPods, and other electronic devices to add Golden Shellback to their product line. He is also working on a new product line called SWAK—Sealed with a Kiss—and is negotiating with a Chinese company to coat MP3 Players and VHF Radios with GS sealant during the manufacturing process.

Martin is too determined to give up his dream. After more than two years of Golden Shellback, he had a revelation. "We had been working with the Fall River Business Development Office and they said we needed to stop coming up with so many ideas and sell what we already have."

"Our intent was always to start a small manufacturing center here in Southeastern Massachusetts. We know there's a trained labor force here." NMI is currently using a laboratory in Fairhaven for GS application, but needs more space.

Sid Martin enjoys working as Director of Technology at the Northeast Maritime Institute and remains close to UMass Dartmouth. He was the university's Commencement speaker in 2009. "I like to think I still have a strong connection with the University. We are really lucky to have a university of this caliber in Southeastern Massachusetts."

ECE Professor Receives Defense Department Grants

Yifei Li, Assistant Professor of Electrical and Computer Engineering, has been awarded a \$550,000 research grant and a \$150,000 Young Faculty Award, from the Defense Advanced Research Projects Agency (DARPA) of the U.S. Department of Defense. Dr. Li's research focuses on radio frequency microwave technology, optical communications, and photonics.

"The way DARPA works is that you generate an idea, and then convince the program manager to fund it," He noted. He received the research grant for development of a photonic integrated circuit (PIC) for radar and imaging that performs high speed, ultra-linear optical phase demodulation from a modulated carrier wave. The project involves working

with DARPA's Microsystems Technology Office, studying chemical, biological, and electromagnetic spectrum detection, signal processing, data communication devices and circuits, and power production.

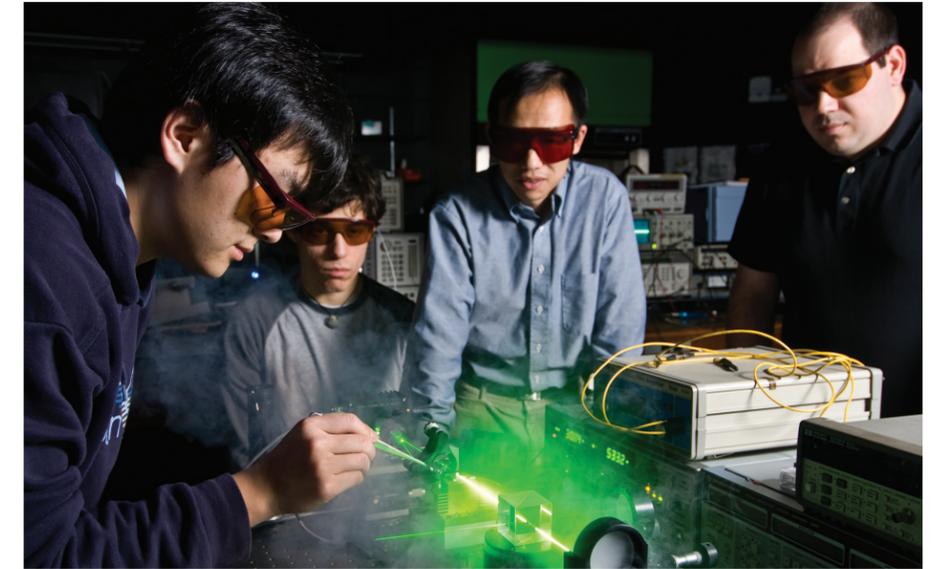
DARPA gives Young Faculty Awards to researchers working in micro systems and defense science technology and provides funding, mentoring, and industry and Department of Defense contacts in order to develop their research ideas. Li has developed an Integrated Photonic Frequency Mixer, which will have a major impact on future high performance RF communications and sensing systems. "They also hope in the future that eventually you will become a DARPA program manager," Li notes.

A highlight of the YFA program is DARPA-sponsored military visits. Recipients are expected to participate in one or more military site visits/exercises to help them understand DOD needs. "I toured a Naval Base in San Diego. It was informative because you see what their needs are, that way you know what Department of Defense wants."

Li and his RF/Photonics Lab/ Research Group also received funds from the Defense University Research Instrumentation Program for a new microwave spectrum analyzer and a frequency vector signal generator. "The analyzer is the most important measuring device in our laboratory and the signal generator will allow us to do more comprehensive testing than in the past."

Li envisions expanding his teaching beyond basic electromagnetics. "Right now, I can show students why they need to learn electromagnetics, but we need advanced courses that utilize cutting edge knowledge and applications. That's hopefully something that will come in the future with increased corporate and government funding."

Li received his BE degree in Opto-electronics Engineering from Huazhong University of Science and Technology in Wuhan, China in 1996. He received his MS and PhD in Electrical Engineering from Drexel University in Philadelphia in 2001 and in 2003. He currently holds four US patents in RF/Photonics.



Dr. Yifei Li (Center) is home in the RF/Photonics Lab in the Dion Building with his research team.

Dr. Nima Rahbar helps to restore the Metropolitan Museum's most famous statue

UMass Dartmouth, Princeton and Columbia Universities are collaborating to restore a valuable marble statue at New York's Metropolitan Museum. Fifteenth century sculptor Tulio Lombardo's *Adam* Statue fell off its pedestal in 2002, breaking its arms and legs. The High-Renaissance era sculpture is one of the museum's most valuable pieces.

"Restoring the statue is like solving a 3D puzzle," said Dr. Nima Rahbar, Assistant Professor of civil and environmental engineering. It is not enough to simply find the best adhesive and fix the statue. "Art conservation people are concerned that the restoration must be reversible, in case a better solution comes along. You can't just glue the pieces together."

The restoration team first used laser-mapping technology to create a three-dimensional "virtual *Adam*." Next, Rahbar and the team determined that a thermoplastic adhesive would be the best choice for marble restoration. This polymer liquefies when heated, sets in a flexible, glassy state when cooled and can be re-softened and reshaped.

Utilizing fracture mechanics, the

collaborative created over six hundred cylindrical samples for a series of fracture splitting tests measuring the interfacial strength of each adhesive sample. The team studied crack routes, holes, and stress points. They also incorporated the metal rods used to reinforce statues into the samples to determine crack routes and what metal will function best.

The restoration work has been done on a pro-bono basis. None of the universities involved has received funding. As Rahbar explains, "We're doing this because we love research, science, and mechanics."

Rahbar received his BS degree in civil engineering from Sharif University of Technology in Tehran, Iran in 1998 and earned his Ph.D. in civil engineering from Princeton University in 2008. His doctoral dissertation was focused on bio-inspired design of functionally-graded dental multi-layers and interfacial fracture and adhesion in multi-layered biomedical systems.

Fuel Cell Expert Gives Back to University

Norman Bessette, ME '90, is a straight-shooter when it comes to giving advice. He advised students at the Freshman Summer Institute (see related story pg.4) to "pay attention in your off-discipline courses. I can guarantee



Professor Nima Rahbar is working with collaborators to restore the New York Metropolitan Museum of Art's 15th century statue, Adam, by fifteenth century sculptor Tullio Lombardo using laser-mapping technology and a thermoplastic adhesive that can be resoftened and reshaped or removed at a later date.

you will work with or manage those in other engineering disciplines and you'll need to understand management principles."

Besette knows from his twenty years' experience that engineering students need to learn basic business skills. "Take some business courses so that you will understand things like balance sheets and cash flow." He tells students that being an engineer today is not just science and math. "The way to advance in engineering is by being verbal and being a good technical writer. All this can be daunting, but you have to adapt."

As Senior Vice President of Engineering and Chief Technology Officer at Acumentrics, a power generation company based in Westwood, Besette is responsible for the engineering and manufacturing of solid oxide fuel cell products, uninterruptible power supply products, and research and development for government, military, and corporate entities. He holds five patents related to SOFC technology.

Solid oxide fuel cells convert hydrogen and carbon monoxide from hydrocarbon fuels into electricity. Acumentrics specializes in tubular, electro-ceramics SOFC technology, which does not require hydrogen. Their SOFCs are fuel flexible and can utilize natural gas, methane, ethanol, propane, biofuels or liquid fuels, making them both versatile and carbon neutral. Acumentrics SOFC's incorporate shatter-resistant ceramics performing at very high temperatures that operate

quietly and generate minimal greenhouse gas emissions. The company received the New England Innovation Award from the Smaller Business Association of New England in 2007

Besette's commitment to giving back to his alma mater is exemplified by his efforts to help UMass Dartmouth obtain a fuel cell for the College of Engineering. "It can be a valuable teaching tool; students can learn a lot from working with it." The generator, valued at approximately \$170,000 will be integrated into the engineering curriculum in 2011. Besette also helped the university procure a \$30,000 state grant to cover installation costs. "It's a win-win situation for Acumentrics," he notes. "Students will learn about SOFC technology and become familiar with our products."

Not surprisingly, he is enthusiastic about sustainability and renewable energy. "With an engineering degree, I'd rather be doing good instead of harm." Besette is knowledgeable and informed about clean energy initiatives, green communities and other environmental programs where fuel cell technology can be used. "Doing something to clean and not burn, is interesting and rewarding." He is quick to point out that "fuel cells have their space in the world, but I don't see them taking over." The challenge is bringing people's expectations in line with reality and realizing green energy can't do everything."

His UMass Dartmouth's education gave him a good foundation in engineering and prepared him for graduate school. He noted

that the UMass undergraduate program focused on teaching rather than research and felt this was appropriate. "I think this is one of the best universities for an undergraduate degree...you can get the fundamentals of engineering here inexpensively."

As an executive who receives countless resumes, Besette stresses to students that an engineer's formal education doesn't end after four years; advanced degrees and some type of project experience are absolute necessities. "The cold, hard truth is that a BS is like a high school degree today. Experience can clearly make up for some of this but...you should get your MS immediately."

Norman Besette obtained his MS and Ph.D. in mechanical engineering from the Georgia Institute of Technology in 1994. Prior to joining Acumentrics in 2001, he spent seven years at Siemens Westinghouse Power Corporation managing a fuel cell facility and overseeing multi-million dollar U.S. Department of Energy contracts.

UMass President Honors Physics professor Marguerite Zarillo for Public Service

University of Massachusetts President Jack M. Wilson today announced the five recipients of the 2010 President's Public Service Award, including UMass Dartmouth Physics Professor Marguerite Zarillo, who is leading a statewide traffic management project.

The awards are presented annually to faculty members from the University's Amherst, Boston, Dartmouth, Lowell and Worcester campuses who have been nominated by the Chancellors of their respective campuses for providing exemplary service to the Commonwealth. This year's honorees include Dr. Zarillo and professors W. Richards (Rick) Adrion, Lisa Gonsalves, Doreen Arcus, and Lucy Candib, who join 76 other faculty members in receiving the recognition since the awards were established in 1998.

"Through these awards, we celebrate the exemplary work of these faculty members who truly embody the University's ethos of academic excellence and service," said President Jack M. Wilson.

President Wilson added: "As a public university, the University of Massachusetts has a three-fold mission of education, research and public service. Our educational and research efforts win many plaudits, and deservedly so, but it is probably the case that we do not hear enough about the public service contribution that the University makes to the Commonwealth and its citizens. So, this is a day to make it known that we take our public service mission very seriously and that we have distinguished faculty members who are working hard and are making a difference in the lives of so many people."

UMass Board of Trustees Chairman Robert J. Manning praised the award winners, noting: "This is the 13th year for the President's Public Service Award and this year's honorees continue the proud tradition of service that has been established at this University and is essential to its character as a public university. We are proud to recognize them and to claim them as members of the UMass community."

Dr. Zarrillo is recognized for her professional expertise and scholarship in traffic engineering and management to benefit local, regional and national transportation providers in planning and operational decisions. She originated and led the UMass multi-campus faculty collaborative for Intelligent Transportation Systems, and has been instrumental in the development and implementation of innovative technologies, efficient maintenance and operational practices to improve



Dr. Alan Hirshfeld (left) makes adjustments to the University's telescope.

existing and future transportation systems.

"Dr. Zarillo is a world class teacher and scientist whose passion for discovery excites her teaching in the classroom and makes communities run better," said Chancellor Jean F. MacCormack.

Dr. Zarrillo's newest research efforts involve the simulation of driving while performing other tasks such as using a cell phone or eating. Her work is also being used to improve traffic patterns around UMass Dartmouth, including Ring Road, parking facilities, and Route 6. Traffic volume data is patterned around class schedules and evacuation strategies. Her students benefit from "service learning" with projects embedded in her classes.

University's Observatory Awarded Endowment for New Equipment

Physics Department faculty members Dr. Alan Hirshfeld and Dr. Grant O'Reilly have received a \$9800 grant from the Chancellor's Public Service

Fund and the UMass Public Service Endowment for their public service proposal, titled *Collaborative Outreach Program: UMass Dartmouth Observatory Phase II*. The award will fund replacement of the electronic mounting on the Observatory's Meade telescope. It will be replaced with a custom-made, computer-controlled, high precision mount from Astro Physics, Inc. "This new mount will allow us to precisely find faint celestial objects. It will be much more reliable and more accurate," said Professor Hirshfeld. In addition to the new mount, alumni gifts have enabled the Observatory to purchase a new, astronomic camera that will provide clear pictures of the night sky

The three-phase plan to raise the Observatory's profile and capabilities has resulted in greatly increased public and academic interest in astronomy. Phase 1 established a partnership with Astronomical Society of Southern New England (ASSNE), a non-profit organization of amateur astronomers. Members help



Graduate student Francesco Piscani, left, and Professor Qinguo Fan are heading a project on campus to create new textile technology that would make the manufacture of specially printed clothing (camouflage, for instance) faster.

to maintain the Observatory, and host monthly community open houses, which allow the general public to use the facilities and telescope for free and learn about astronomy. "ASSNE's involvement has greatly raised our profile to the general public," said Hirshfeld.

The public outreach program has been so successful that the UMass Dartmouth Observatory has become part of NASA's Night Sky Network. Phase two includes the installation of the new telescope mount and camera equipment. Hirshfeld hopes to move on to Phase 3; which involves expanding the observatory into a multi-faceted educational facility.

Bioengineering project will help protect soldiers

The College of Engineering's Bioengineering Department has entered into an agreement with the U.S. Army Natick Soldier Systems Center to create new textile technology that would make the manufacture of camouflage uniforms faster. This new technology provides greater flexibility and faster manufacturing methods that can easily be adapted by

local textile companies.

Professor Qinguo Fan and his students have been researching the chemistry and physics behind digital textile printing for five years. Now, the Bioengineering Department, working in conjunction with the Advanced Technology and Manufacturing Center in Fall River is partnering with the Natick center and to take the project to the next level. "By working with Natick, we can manufacture a prototype to show the local textile industry how this is going to work," Fan said.

The project is designed to help Army research and development programs by cutting the lead time between development of new patterns and the fabrication of prototypes. The agreement calls for UMass Dartmouth and the Natick center to share research and resources. The center will provide in-kind resources and serve as an advocate when the department seeks funding for the project.

Rudimentary ink jetting of fabrics already exists, but it's limited in the types of inks that can be used. Commercially available pigments have particles that are too large to pass through the tiny nozzles of ink-jet printing. The particles also tend

to create larger clusters.

Fan's research addresses this by finding ways to make the particles smaller and more consistent in their size. The Bioengineering Department is refining the ink pigments and their curing properties, to make sure inks can safely jet through print heads and dry quickly.

The Department is also designing an ink-jet printing device for retrofitting traditional rotary screen printing equipment. Five UMass Dartmouth students are working with Fan on the project, giving them an opportunity to learn about a promising field. "Digital textile printing is cutting edge technology," he said. "By training students in this area, they learn a lot—not just the basics; chemistry, physics—but also the latest technology, which is going to be very beneficial to them to be hired by the industry."

Francesco Piscani, a graduate student currently working on the project, said the initiative has the potential for many civilian applications. But at the same time it's a way to help members of the armed forces. "It's a way for us to do our part while they do their part."

The Advanced Technology and Manufacturing Center is focusing on the project's potential benefits to the local textile industry. "The traditional printing process makes it difficult for the textile industry to make limited samples of wallpaper or other products, so companies might end up producing more than they want. This new ink-jet technology would allow them to adjust the output to fit specific needs," said ATMC Director Louis J. Petrovic.

Jeff Ditullio, technology transfer manager at the Natick center, added: "We have critical internal objectives we feel we can better achieve by working with academia and industry whenever possible, but we also recognize our obligation to leverage military-related innovation to benefit the public and industry. This technology offers the region's textile companies a way of expanding their product line by just-in-time kind of production."

John Sladewski/*The Standard-Times*

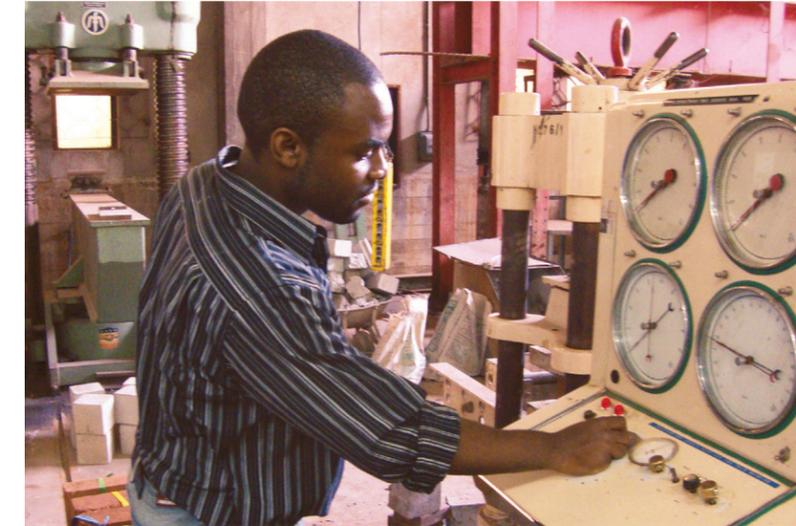


A world class education provides an opportunity to make a global impact

The Urban Massachusetts Alliance for Minority Participation (UMLSAMP) is an alliance of 8 institutions: the University of Massachusetts' Boston, Dartmouth, and Lowell campuses; Wentworth Institute of Technology; and Bristol, Bunker Hill, Middlesex, and Roxbury Community Colleges. Funded through the National Science Foundation, the Alliance's mission is to increase the overall number of students (especially under-represented minority students) earning degrees in Science, Technology, Engineering and Mathematics (STEM). Eleven UMass Dartmouth students took part in this program during the 2009-2010 academic year.

Senior Willem Leveille studied fiber reinforcement for composite materials. His research led to an additional LSAMP grant to study and work abroad under the program's International Center for Undergraduate Research Experiences. From May to August of 2010, Leveille lived at the YMCA in Nairobi, Kenya, working on developing sustainable materials for reinforcing sand dams. "We had to make everything cost-effective for the locals," said Leveille. He adds that "I believe, at the very least, we made significant steps for further research."

Since his return from Kenya, Leveille has been working on a Civil & Environmental Engineering project titled Novel Use of Ion Exchange



"Before LSAMP, I knew I wanted to use my profession and education to help others. Without LSAMP, I feel I would have never done this kind of research or studied Civil Engineering. Going to Kenya and being in LSAMP opened my eyes."

—Willem Leveille

Nanofibers for Trouble-Free Methane Generation from Biomass and Organic Waste. Leveille credits LSAMP for his passion for Civil Engineering. "Before LSAMP, I knew I wanted to use my profession and education to help others. Without LSAMP, I feel I would have never done this kind of research or studied Civil Engineering. Going to Kenya and being in LSAMP opened my eyes."

Dr. Tesfay Meressi, Associate Dean for Engineering and LSAMP site coordinator has been very pleased with the program's impact on students like Leveille. "This program has been a great success. Many of LSAMP scholars work in research labs on cutting edge projects under faculty supervision. We are very proud of their accomplishments and we hope to involve many more undergraduate students in the LSAMP program."

Please help us educate the next generation of engineers

The Annual Fund makes it possible for students like Willem to follow their dreams and make a significant impact on the daily lives of people in the developing world. Willem might not have been able to pursue an engineering degree without the support of donors like you.

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