



UNIVERSITY OF
Rhode Island

FALL 2004

ENGINEERING

**ADVANCE BRINGS
NEW TALENT TO URI**

**NEW
PARTNERSHIPS FOR
MULTIDISCIPLINARY
RESEARCH**

**INTERNATIONAL
ENGINEERING
PROGRAM EXPANDS**

**ENGINEERING THRIVES
ON INTELLECTUAL
PROPERTY ASSETS**

**ENGINEERING
STUDENTS COMPETE
TO WIN**

**ARCTIC CORING
EXPEDITION**

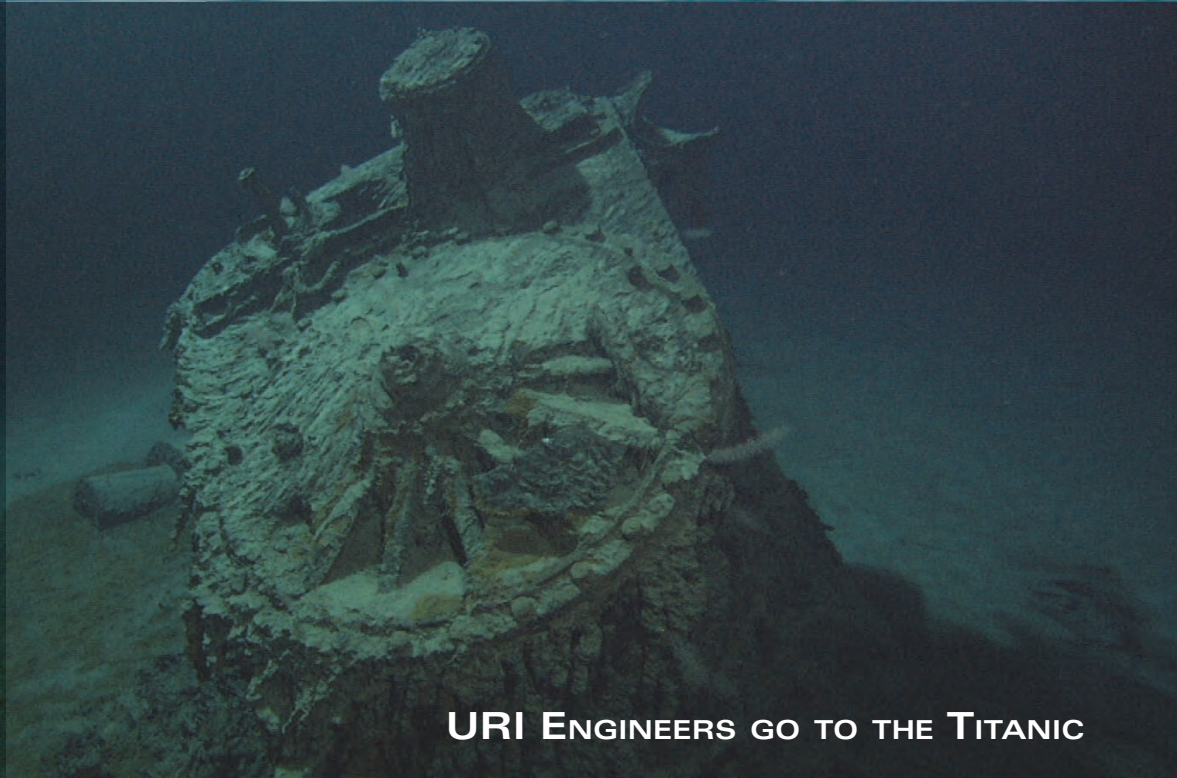
**ENGINEERING
CONFERS 167
DEGREES**

**7TH ANNUAL
INTERNATIONAL
ENGINEERING
COLLOQUIUM –
SEPTEMBER 30**

**SECOND ANNUAL
ENGINEERING ALUMNI
DAY – OCTOBER 22**



**ENGINEERING STUDENT TIM PITTS GOES FOR THE
GOLD AT THE 2004 ATHENS OLYMPICS**



URI ENGINEERS GO TO THE TITANIC



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From the Dean



Providing skilled engineers dedicated to problem solving and innovation is the commitment of the URI College of Engineering. In its more than a century of achievements, the College has reached out to provide a quality engineering education to a wide and diverse range of talented students seeking the best in engineering knowledge.

The URI engineering adventure is one that recognizes the need for graduates to be prepared to begin their professional practice immediately upon graduation. With a strong emphasis on professional practice, the College provides educational programs that are intellectually

rigorous and broadly conceived to prepare the student for a lifetime in engineering and beyond. The education that our students receive prepares them to confront the most challenging problems facing our world.

Our commitment is not only to educating our students but to the State of Rhode Island and to the world. Therefore, the College actively seeks opportunities to partner with industry and government to serve the public interest and foster economic development. In this issue, you will read about some of the collaborative programs we've developed to meet this goal.

Providing skilled engineers dedicated to problem solving and innovation is the commitment of the URI College of Engineering.

URI engineering combines a strong traditional education with a non-traditional approach to innovation and research. Examples can be found in our centers of excellence in sensors, ocean instrumentation, nanotechnology, biomedical engineering, impact dynamics, and transportation engineering.

Our faculty reflects our deep commitment to excellence and scholarship. The engineering faculty combine their vast research and educational experience with their extensive experience in professional practice to create a unique learning environment and professional guidance.

This issue of URI Engineering brings you highlights of the achievements of our faculty, students, alumni, and programs during spring and summer 2004. I hope that you

...the College actively seeks opportunities to partner with industry and government to serve the public interest and foster economic development.

will enjoy reading this publication and encourage you to comment on those topics that interest you.

We have an exciting array of events planned for the fall, including the annual Golf Outing, Career Day, Alumni Day, and the Awards Banquet (to recognize outstanding faculty and staff performances and new inductions into the Engineering Hall of Fame and Founders' Club). I invite you to join us for the upcoming College events that are listed on the back cover of this issue.

*Bahram Nassersharif, Ph.D.
Dean of Engineering*

Dr. Mercedes Rivero-Hudec Appointed Associate Dean of Students and Diversity

Erika Conca



Mercedes Rivero-Hudec

The University of Rhode Island's College of Engineering has created a new position to help the College expand the recruiting and retention of students in the undergraduate engineering program by 20 percent over the next five years. Dr. Mercedes Rivero-Hudec is the newly appointed associate dean of students and diversity.

After 13 years as a faculty member of chemical engineering, Dr. Rivero-Hudec is eager to start working with all the departments to reach the College's goal of expanding and improving the recruiting and retention of undergraduate students. She will also be working on the reaccreditations of all the engineering programs, requiring input from every single department.

In her new position, Dr. Rivero-Hudec will help facilitate diversity within the College, which in turn will impact the recruitment and retention of

undergraduate students. Dr. Rivero-Hudec will coordinate the freshmen and the capstone design courses in engineering as well as scholarship awards for students.

Teaching is very important to Dr. Rivero-Hudec. In addition to her new responsibilities, she plans to continue teaching a required course in the master's degree program in chemical engineering, "Dynamics of Chemical Engineering Applications."

Dr. Rivero-Hudec is involved in the International Engineering Program (IEP) as well, having played an important part in the establishment

Dr. Rivero-Hudec will facilitate diversity within the College, which in turn will impact the recruitment and retention of undergraduate students.

of the IEP in Spanish (IEPS). She developed and teaches "Advanced Technical Spanish" for the IEPS.

She is also involved with the graduate program in the Clinical Laboratory Sciences offered by the department of cell and molecular biology in the College of Environmental and Life Sciences.

Along with teaching, Dr. Rivero-Hudec is an advisor of graduate and undergraduate students. She is also the advisor of the chemical engineering class of 2005.

Dr. Rivero-Hudec was born and raised in Venezuela, where she earned her undergraduate degree in chemical engineering at the University Simon

Bolivar. After two years of work in Venezuela, Dr. Rivero-Hudec came to the United States for her master's and doctorate degrees, which she earned at the University of Pennsylvania.

Dr. Rivero-Hudec joined the faculty at University of Rhode Island in 1991. For the past eight years, her research interests have been in the environmental area, with focus on material deterioration and waste recovery. More specifically, Dr. Rivero-Hudec has concentrated on the biological processes in engineering. "My current project involves microorganisms in the environment.

I'd like to keep expanding in the area of biological processes, either the effects of microorganisms on materials or the recovery of materials by microorganisms," she said. NSF, RIDOT/URITC, FIPSE and The Champlin Foundation

have supported Dr. Rivero-Hudec's research and educational projects.

When she is not devoting all of her attention to engineering, Dr. Rivero-Hudec focuses on nature at small and large scales; she grows orchids, enjoys astronomy and has recently started to learn about wildlife rehabilitation.

Dr. Rivero-Hudec has a positive feeling about her new position as dean of students and diversity. As for her expectations, she is confident that she will be able to assist the College in reaching the goals they have set over the next five years.

Arijit Bose Named Chair of Chemical Engineering

Praveena Kunaparaju

The College of Engineering has appointed Arijit Bose, professor of chemical engineering, chair of the department of chemical engineering.

"We are pleased to have Dr. Bose serve as chair of the chemical engineering department," said Bahram Nassersharif, dean of the College of Engineering. "He brings to the position an impressive background of research and teaching, and I expect the College to grow under his leadership."

Dr. Bose, who has been at URI since 1982, is enthusiastic about the appointment. "I am excited because of many new opportunities in the field of chemical engineering, linked to key advances taking place in biology, materials science, nanotechnology and computing," he said. "Each of these will have a major impact on the field, and will profoundly affect the way we educate our students and conduct research. In particular, we have an opportunity to respond in a substantial and unique way to major new developments in biology, and we have to seize this chance. The ability to help shape department activities to reflect these new realities is exciting."

Dr. Bose has been presented twice with the College of Engineering's Vincent and Estelle Murphy Award for outstanding research. He is an associate editor of the *IEEE Transactions in Nanotechnology*, and serves on the editorial board of the *Journal of Surface Science and Technology*. He has been a visiting scientist at MIT (1989, 1995-96), and has just returned to URI after a two-year appointment in industry as a visiting senior scientist at Cabot Corporation (2002-2004). Dr. Bose has over 65 journal publications, holds three U.S. patents, and has lectured extensively at universities throughout the world, professional meetings and industry. His current research encompasses colloidal and interfacial engineering, with specific efforts in the areas of nanostructured materials synthesis and characterization, direct imaging of soft colloid aggregates and colloidal magnetic separations. Several of his former students now hold leadership positions in academia and industry.

Among his goals for the department is more emphasis on scholarship, research and industrial



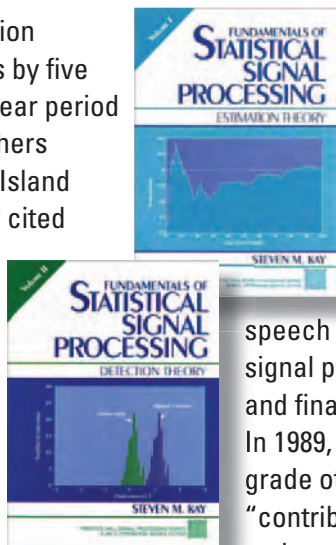
outreach. "I want to increase the quality of education given to our students by acknowledging good teaching and mentoring, and involving faculty and students in cutting-edge research. I also want to encourage more local and national industries to employ our fine undergraduate and graduate students, and have more of our undergraduates go to graduate school," said Dr. Bose.

Dr. Bose concluded, "Chemical engineering is at a crossroads today, which is both a challenge and an opportunity. I am confident that with the high quality of my colleagues, staff and students, we can enhance our program to deliver a nationally competitive and relevant education to our students while maintaining a collegial, forward-looking environment for our faculty to pursue their goals."

Professor Kay Among World's Most Highly Cited Researchers

An analysis of 19 million published research papers by five million authors over a 20-year period has found that six researchers at the University of Rhode Island are among the most highly cited scientists in the world.

Among these is Steven Kay, professor of electrical engineering at the University. Dr. Kay conducts research in mathematical statistics with applications to digital signal processing.



This includes the theory of detection, estimation, time series, and spectral analysis with applications to radar, sonar, communications, image processing, speech processing, biomedical signal processing, vibration, and financial data analysis. In 1989, he was elected to the grade of Fellow of the IEEE for "contributions to the theory and application of parametric

spectral estimation and detection."

"It is a great honor to be included on such a prestigious list and very gratifying to know that so many researchers have found my work useful," said Dr. Kay. "Such an achievement would have not been possible without the contributions of many individuals. Foremost is the enthusiasm of the many graduate students that I have been privileged to direct in research and also to the support of my colleagues in the department of electrical computer engineering."

ADVANCing Women in Engineering

Praveena Kunaparaju



Encouraging women to achieve full potential in science careers as engineers and leaders has long been a goal of the University. To that end, URI has embarked on a new initiative, called ADVANCE, a five-year, \$3.5-million project, funded by the National Science Foundation, designed to improve and enrich the scientific, technology, engineering, and mathematics academic workforce at URI through the increased representation and participation of women faculty.

Barbara Silver, program director for the project, explained, "We are making substantial efforts towards increasing departmental awareness of the issues that impact women's professional success. ADVANCE is a multi-faceted, broad-based program to improve the overall work environment and the participation of women at many levels."

In September 2003, URI received a five-year Institutional Transformation Award to accomplish these goals. Project efforts will include assessment, faculty recruitment, faculty development, work/family policy initiatives, developing professional and social support networks, and overall climate change. The ADVANCE team is led by Vice Provost Janett Trubatch, as lead PI.

A major focus of the ADVANCE initiative is the Faculty Fellows and Supplemental Funding Program. "This year we hope to hire seven new

faculty in psychology, physics, plant sciences, cell and molecular biology, graduate school of oceanography, electrical and computer engineering, and civil and environmental engineering," said Silver.

ADVANCE funding will be made available to support faculty fellows for up to three years in departments that have been approved by the Provost. The purpose of the program is to develop high-potential candidates who will then transition into tenure-track faculty positions. Where a regular hire is more appropriate, ADVANCE can offer supplemental funding in order to provide a more attractive package to candidates.

According to Silver, "The most important message that we want to convey to the University is that although ADVANCE is geared toward women faculty in science and engineering, the program will benefit the interests of other departments and the University in general. For example, ADVANCE and the President's Commission on the Status of Women recently submitted a revised Family Leave Policy to the President that, if adopted, could

have a significant impact on all URI personnel."

Programs such as incentive awards, career workshops, a mentor training program, and monthly topical lunches will be held, and will be available to those outside the science and engineering disciplines. The NSF ADVANCE Incentive Fund, which bestowed eight awards in its first round last spring, invites URI personnel, men and women, to apply for awards that promote the careers of women faculty in science, technology, engineering and mathematics (STEM). The fund supports efforts by individuals or departments that foster climate or organizational change, support research by women faculty, and further the general goals of ADVANCE.

The Mentor Training Program



Valerie Maier-Sperdelozzi, assistant professor in industrial and manufacturing engineering, demonstrates the Laser Engineered Net Shaping (TM), or LENS machine. She is one of the recipients of 2004 ADVANCE Incentive Funds. The incentive grants are designed to support efforts to foster climate change consistent with ADVANCE goals.

will begin in the fall and will be coordinated by Dr. Bette Erickson, assistant director of the Instructional Development Program, and Dr. Joan Peckham, professor of computer science. Dr. Erickson has won awards for conducting a highly successful series of faculty development workshops at URI, including a yearlong Faculty Fellows Program for STEM faculty on effective and innovative pedagogy and curriculum development in these disciplines.

A series of career workshops will also begin in the fall of 2004. For example, Dr. Laura Beauvais, professor of management in the College of Business, will work with Dr. Donna Meyer, assistant professor of mechanical engineering, to present a workshop focused on developing negotiation skills.

There will be programs for the entire campus, as well. "On November 5th, we will be holding a significant event that we hope the whole campus will attend," Silver said. "Virginia Valian, a professor of psychology and linguistics at Hunter College and the author of *Why So Slow?: Women in Science*, will speak at URI about women's advancement in science. We intend to announce the results of the Academic Work Environment Survey, distributed in May, at this event as well."

Silver concluded, "Our world and our work environments are becoming increasingly diverse. If URI is to participate as a progressive institution, we need to develop the awareness, the means and the materials to promote diversity, and work toward improving the working climate for all faculty, particularly for women and other underrepresented groups."



Two ADVANCE Faculty Hired

Two new faculty members have been hired at the College of Engineering through the ADVANCE program.

Yan Sun has been hired as a NSF ADVANCE assistant professor in the electrical and computer engineering department. She received her doctoral degree from the University of Maryland at College Park in May 2004. Her research spans several areas in electrical engineering and computer science, including network security, wireless communications and networking, and multimedia signal processing.

Dr. Sun is delighted to be joining the URI community. "I chose



Dr. Yan Sun, ADVANCE assistant professor of electrical engineering

URI because it provides the most supportive working environment. The department, the faculties and the ADVANCE program make me feel that I can achieve my career goal with freedom and support," she noted. "Academically, I would like to establish a strong research program on wireless network security. I will work with faculty members in ECE and other departments, and investigate various aspects of securing wireless networking, including intrusion detection, key management in mobile environments, secure *ad hoc* routing,

theoretical information framework of trust, and sensor network security."

Mayrai Gindy has been hired as an assistant professor starting in the fall in the department of civil and environmental engineering. She received her doctoral degree from Rutgers School of Engineering. Dr. Gindy said, "I am very excited and energized about starting this fall semester. I'm eager to work alongside the civil engineering faculty members. Being a researcher and teacher is what I've been working towards for a long time now."

Her research project involved the planning and implementation of a comprehensive sensor network for



Dr. Mayrai Gindy, ADVANCE assistant professor of civil and environmental engineering

the large-scale testing and long-term monitoring of the Doremus Avenue Bridge, New Jersey's initial LRFD design.

Dr. Gindy is a strong advocate of the ADVANCE program at URI. "The NSF ADVANCE program provides the stepping-stone for young professors to establish and build their research at a great learning institution," she said. "And although it is geared towards women faculty, I believe that it will benefit a larger population by promoting diversity and encouraging new ideas."



Professors Rose and Urish Retire

Praveena Kunaparaju

Vincent Rose

Chemical Engineering Professor Vincent Rose joined the faculty at URI in 1963. In his more than four decades at the University, Dr. Rose served many roles: director of the nuclear engineering master's program, founding faculty at the department of ocean engineering, associate dean of the graduate school, radiation safety officer, department chair, and ombudsperson.

Dr. Rose has been a Marshal for graduation ceremonies and for many years served as an advisor for the URI chapter of Tau Beta Pi, the national Engineering Honor Society.

He has represented URI on the Rhode Island Atomic Energy



Vincent Rose

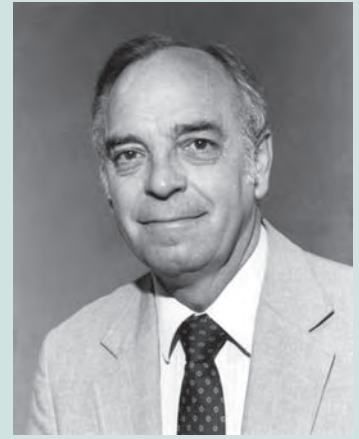
Commission, Greenhouse Gas Task Force and State Energy Office Renewable Energy Fund Advisory Committee. He has been active in community, state and national organizations, including the Rhode Island section of the American Institute of Chemical Engineers, the New England Section of the American Society for Engineering Education, the Northeast Association of Graduate Schools, the American Boat Builders and Repairers Association and Save the Bay. He is a registered professional engineer and a certified septic system installer.

Looking ahead, Dr. Rose intends to continue his research in the area of water conservation and treatment, and help the University attract more students to the engineering program.

Daniel W. Urish

Professor Dan Urish began his career in academic research and teaching when he joined URI in 1978 as an assistant professor, after serving 25 years in the United States Navy. A registered professional engineer and land surveyor, he has been an exceptional member of the Civil and Environmental Engineering Department, having served as department chair, director of the state Water Resources Center, director of the URI Transportation Center and director of the Department of Defense Research and Training Center at Quonset Point, R.I., as well as many state boards and committees.

Dr. Urish has consistently maintained a strong research program, exhibited excellence in both undergraduate and graduate instruction, and dedicated himself in exemplary service to the CVE department, the College



Dan Urish

of Engineering, the University of Rhode Island, and the professional community. In 1994 he earned the recognition of his professional peers in his selection as "Rhode Island Engineer of the Year." In reflecting on his academic career, he stated, "it has been a privilege and pleasure to have served the students and leaders of future generations for the past 25 years, and to see our students mature into professional and contributing engineers in the community."

When asked about his plans for retirement, Dr. Urish said, "I will continue to pursue research in my special area of expertise, groundwater on islands. My current research includes groundwater environmental studies on Rose Island in Narragansett Bay, groundwater exploration on Terceira Island in the Azores with the University of the Azores, and hydrologic studies on the islands of Belize with the Smithsonian Institution. I also intend to spend more time in my artistic pursuits as a member of the Wickford Art Association."



Dan Urish surveying in Belize mangrove swamp, July 04

Professors Bose and Kumaresan Promoted to Professor III

The College of Engineering is pleased to announce the promotion of Drs. Arijit Bose and Ramdas Kumaresan to the rank of Full Professor III. This highest faculty ranking is awarded to tenured professors who exhibit excellence in teaching, research and service.



Arijit Bose

Chemical Engineering Professor Arijit Bose joined the URI faculty in 1982 as an assistant professor. He has gained international recognition in his field of nanotechnology, as demonstrated by his invited talks and his stewardship of the NSF-funded Japan-U.S. exchange program for young scientists involved in nanotechnology research. He serves as associate editor of *IEEE Transactions in Nanotechnology*.

Dr. Bose has been the author or co-author of 33 journal articles since 1998, and has served as PI or Co-PI on 17 sponsored grants or contracts totaling nearly \$1.5 million during the same period.

Recently named chair of the chemical engineering department (see article on page 5), Dr. Bose is known as a demanding teacher who serves as an important mentor to his students. He has been the graduate program director in chemical engineering, and chaired the search for the two professorships in engineering, the Chester Kirk and Victor Baxt Professors. He also served as the faculty mentor for Dr. Michael Greenfield.



Ramdas Kumaresan, professor of electrical and computer engineering, joined the faculty in 1983 after completing his Ph.D. at URI. Dr. Kumaresan is internationally renowned for his work in the field of computer processing of speech signals. His published work has appeared in a number of prestigious publications, including *IEEE Transactions on Speech and Audio Processing* and the *Journal of the Acoustical Society of America*, and he serves as a reviewer for two journals and for the National Science Foundation.

Dr. Kumaresan is an active member of the University Honors Program scholarship committee, and has served on the departmental Graduate Affairs committee. A

dedicated teacher, he recently oversaw the development of a new laboratory, the Experiential Signal Processing (ESP) Lab, to provide hands-on experience to students in the area of communications systems design.

“Arijit Bose and Ramdas Kumaresan are among the most accomplished, dedicated members of the engineering faculty,” said COE Dean Bahram Nassersharif. “Their promotion is well deserved, given their significant contributions in the areas of research, publication and teaching, which have enhanced the engineering program at URI.”



Ramdas Kumaresan



Partnership Programs Foster Multidisciplinary Research

Praveena Kunaparaju

In June, the URI President Carothers' Partnership Program announced the establishment of three new partnerships at the University of Rhode Island: the Partnership in Food, Hunger and Nutrition; the 3D Group for Interactive Visualization; and the Partnership for Ocean Instrumentation.

The Partnership Program began in 1995, when the URI Faculty Senate approved a plan to support multidisciplinary research-educational partnerships. The goal of these partnerships is to encourage multidisciplinary research that emphasizes student research and outreach to the non-academic community.

To date, eleven have been funded at the University. Engineering plays an important part in a number of them, including the newly formed Partnership in Ocean Instrumentation; the Sensors and Surface Technology Partnership; and the 3D Group for Interactive Visualization. Following is a brief look at these partnerships.

Partnership for Ocean Instrumentation (POI)

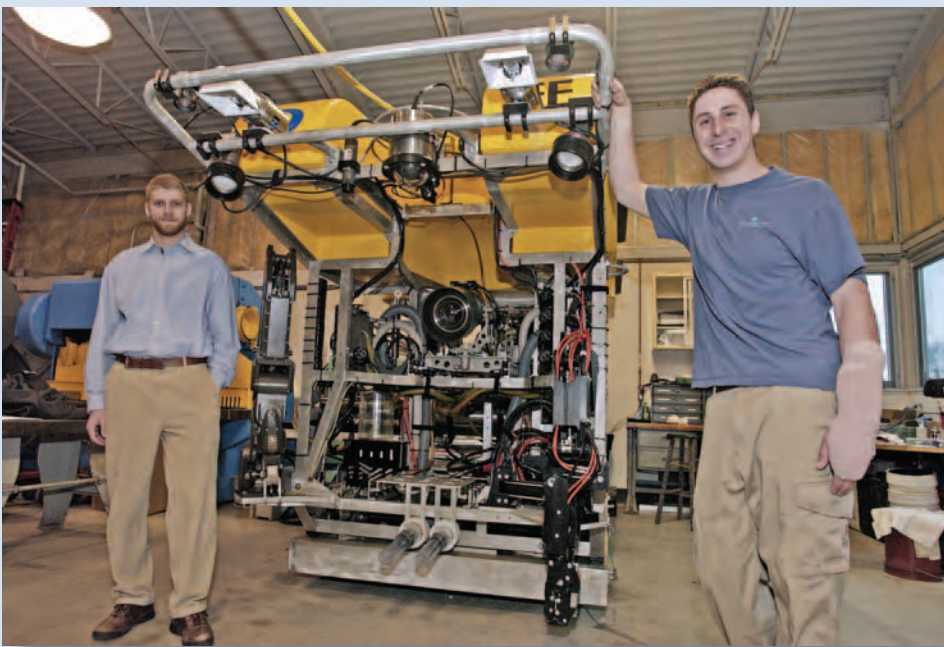
The POI is aimed at developing advanced ocean instrumentation and providing an innovative internship experience for students. Robert Tyce of ocean engineering and John King, from the graduate school of oceanography, are the codirectors of this partnership.

Tyce was appointed codirector upon his return from Italy last summer, where he worked for NATO as head of Military Oceanography and Rapid Environmental Assessment at SACLANT Undersea Research Center. Tyce said, "The POI is a Rhode Island effort to involve students in developing new instruments related to the ocean. We have been discussing several ways for various departments to work together. Deans Nassersharif and Farmer and Associate Deans Gregory and Farrell have shown great enthusiasm in the formation of the partnership. NSF is presently looking at significant investments in the area

of ocean instrumentation. We are also expecting support from industry, government and the university. With guidance from a multidisciplinary faculty, industrial partners and international advisors, we expect to develop new instrumentation for ocean scientists and engineers using student interns."

By integrating efforts with URI research projects, POI expects to produce prototypes of new instruments of sufficient interest to agencies and industry to result in outside funding for the next cycle of development, involving both URI scientists and student interns. Tyce said, "One challenging aspect of the partnership is to help engineers and oceanographers understand each others' objectives. Oceanographers generally build instruments for the resulting measurements whereas engineers tend to focus on the instrument design process and subsequent production. The partnership is expected to consist of teams of scientists, engineers and students working together on development and application of new instruments."

The partnership expects that one of the outcomes will be the vigorous pursuit of external education and research funding to support continuation of the partnership. According to Tyce, "We want to inculcate interest in high school students by offering summer courses in the field of robotics and instrumentation. We want to organize an internationally recognized summer institute in ocean instrumentation that offers income-producing professional development and URI courses taught for credit by URI as well as by invited international experts."



l-r: Webb Pinner and Brennan Phillips, students in Ocean Engineering

Sensors and Surface Technology

The Sensors and Surface Technology Partnership (SSTP) started in 1996 and currently consists of eighteen faculty members from several engineering departments, physics, chemistry, oceanography and textiles. The SSTP's primary focus areas include chemical sensors, physical sensors, optical sensors, nanofabrication, microchannels, microstructural engineering, and specialty coatings for fibers, corrosion resistance and antifouling.

Dr. Otto Gregory, one of the co-directors of the SSTP, said, "We tend to focus on basic science and applied sensor technology. The research area covers the full gamut of physics, chemistry and sensor devices."

Physical sensors for strain, temperature, and pressure measurement; chemical sensors for humidity, carbon monoxide and carbon dioxide; and biological sensors for food pathogens are just a few examples of the sensor technologies being developed by SSTP investigators. The applications for these sensors are numerous. In one type of sensor, pathogen contamination in seafood can be detected at much lower levels than can be achieved with other types of sensors. Cost-effective temperature and humidity sensors are also being developed within the SSTP, as well as optical sensors to measure

the cumulative strain in structural components for damage assessment, and bio-fouling sensors for remote ocean measurements.

One of the research efforts supported by the SSTP is to develop an inexpensive yet sensitive infrared sensor to be used in imaging applications. This research has resulted in collaboration with Teltron Technologies, Inc., and Video Display Corp.

The benefits of the partnership extend beyond the technology. Since its inception seven years ago, the SSTP has trained a large number of students, enabling them to work in a team environment and providing opportunities to present their work at SSTP poster and seminar sessions.

According to Dr. Gregory, "The projects enable undergraduates to work in multidisciplinary teams, imparting a meaningful research experience for undergraduates and helping them move much closer to the real world. For faculty members, the partnership provides an opportunity to cross-pollinate their ideas, hone their grant writing skills, and foster stronger ties to the NSF, Department of Energy and Department of Defense. Another significant benefit is that their work is getting patented and licensed."

Dr. Gregory added, "Our ultimate goal is to have our work result in everyday products that stand to benefit everyone."

The 3D Group

The 3D Group is involved in the research, development, teaching and cross-disciplinary utilization of three-dimensional modeling, animation and interactivity. Like the other partnerships, the 3D Group is composed of a team of faculty, and undergraduate and graduate students. The core group of faculty and students come from computer science and art disciplines, but because these disciplines provide visual information, the group brings valuable conceptual information to a wide range of current URI research projects.

A member of the team, computer engineering student Elizete Fernandes, finds the experience stimulating. Fernandes is helping to develop a computerized approach to simulate pedestrian behavior in non-emergency evacuation and non-emergency scenarios. Fernandes likes working in a team. "I'm learning how to go about organizing a big project, where to start, and how to work in groups. It's exciting," she said.

Clift Manzanillo, who studies computer science, is another member of the 3-D group, and is working on a project to reconstruct and visualize a rat's brain to show target proteins that locate cells affected by lead poisoning. The young computer scientist speaks of his work with the enthusiasm of someone who just won the lottery. "I enjoy the team environment," said the senior, who hopes to focus on computer graphics at graduate school at URI.

Another current interdisciplinary project is an in-depth view of knee mechanics to show maximum joint stress that the knee experiences. This information has the potential to aid physical therapists, among others.

"The partnership is really a win-win situation for everyone," said Jean-Yves Hervé, professor of computer science and one of the directors of the partnership.



Ren Sharma, Graduate Student in Mechanical Engineering presenter a poster on his research on the use of bio-ferrography for evaluating wear debris generated in artificial implants.



Tara Aboyoun, Graduate Student in Chemical Engineering, presenting her work on the direct conversion of water to hydrogen using photolysis. Tara won 3rd place for her work at the SSTP poster competition.

International Engineering Program Continues to Expand

Erika Conca

The International Engineering Program (IEP) at URI keeps growing. The distinctive academic program, which enrolls nearly 200 undergraduates a year, is now expanding to include graduate students.

IEP students study language and culture each semester along with their engineering curriculum. The five-year undergraduate program includes going abroad the fourth year for internships with engineering-based firms in Europe or Latin America.

The new dual master's degree program in German/engineering follows that model. German master's degree IEP students will spend half their time studying at URI, and the other half in Germany.

IEP Executive Director John Grandin worked with the Technische Universitat Braunschweig in Germany,

a partner school to URI, to create the unique dual master's degree program. Grandin was motivated because of the rapidly expanding global economy. "Engineering is practiced internationally today and graduates at all levels need to be sensitive to different cultures and prepared to work with colleagues throughout the world. Having intensive experience in another engineering culture and degree recognition from both a North American and a European university

Having intensive experience in another engineering culture and degree recognition from both a North American and a European university provides outstanding credentials for young engineers today.

provides outstanding credentials for young engineers today. They will be better prepared for the global workplace and will be readily hired by global firms," Grandin said.

Graduate students enrolled in the program are required to complete half of their course work at URI and half at Branschweig, enabling them to receive two degrees, an M.S. from URI and a Diplom from Braunschweig. A grant from the German Ministry of Economics and Labor is contributing to the development of the program, and is

also matching scholarship dollars for students who accept the challenge of the program.

The German government has provided travel grants for faculty to coordinate activities. In January 2004, six professors from URI, including John Grandin, Harold Knickle, Wayne Lee, Hamouda Ghonem, Godi Fischer, and Robert Tyce, flew to Germany to examine the German educational system, discuss details of the exchange program, and explore potential research and teaching collaborations. Several months later, in March 2004, a team of professors from Germany visited URI to familiarize themselves with URI and College of Engineering, and to meet with dual degree candidates.

The new program has already attracted potential students. Graduate student Eric Sargent, who just completed his first year at URI, will go to Braunschweig in September and be the first URI student to complete the program.

Grandin plans to expand the program to other languages and cultures, as well as to more advanced degrees. A joint doctoral program is already being talked about, along with the potential of trilateral degree programs involving universities from at least three countries.



Standing, from left to right: Dieter Dinkler, Manfred Krafczyk, Martin Koch, Andreas Waag, Robert Tyce, John Grandin, Stephan Scholl
In front, from left to right: Rainer Tutsch, Peter Nübold



l-r: URI Engineering Dean Bahram Nassersharif, IEP Director Professor John Grandin and Professor Dieter Dinkler

Professor Moran Leads Historic Polar Expedition

Lisa Cugini

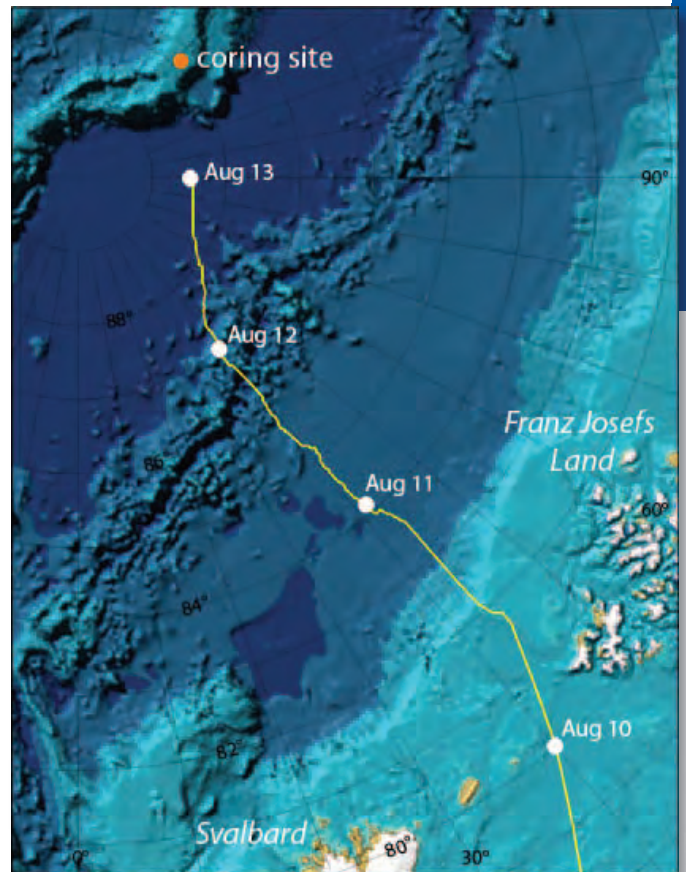
August 2004 marked the beginning of a new chapter in the history of Arctic exploration and research as three icebreakers headed toward the North Pole on an expedition to study the geological history of the Arctic Ocean.

URI Ocean Engineering Professor Kate Moran is one of two chief scientists leading the expedition; the other is Dr. Jan Backman of Stockholm University in Sweden. Other URI oceanographers taking part in the expedition are geologists Dr. John Farrell and Matthew O'Regan and microbiologist Dr. David Smith. Kathy Couchon, a middle-school teacher from Narragansett, R.I., will also participate in the expedition as part of a research and mentoring program for teachers based at URI/GSO.

The primary objective of the Arctic Coring Expedition (ACEX) is to drill several hundred meters into the

sediments of the Lomonosov Ridge, an underwater mountain chain. This operation is the most ambitious of its kind ever attempted in such a hostile environment.

By analyzing samples from the 500-meter-thick sediment on top of the ridge, scientists will reconstruct the climatic and environmental history of the Arctic over the past 50 million years. The Arctic plays a fundamental role in regulating the planet's climate, and scientists hope to gain significant information about ancient climate that may provide insight into the effects of future climate change.



Track of the convoy heading towards the coring site. Map of the ocean floor based on the International Bathymetric Chart of the Arctic Ocean, IBCAO.



The scientific leaders of the Arctic Coring Expedition: Prof. Kate Moran, University of Rhode Island, and Prof. Jan Backman, University of Stockholm



VIDAR VIKING berthing in Tromsø.

Transformation from Ideas to Innovation to Products

Laura Nelson

Sensors that can warn of structural damage after natural catastrophes. Automated page-turners that enable handicapped people to read on their own. Motion-tracking cameras that perform automatic surveillance.

These are only a few of the exciting ideas coming out of the laboratories and classrooms of the College of Engineering and making their way into the real world via patents and licensing agreements.

The process of turning University research into new products and businesses is managed by the URI Research Office's Division of Industrial Research and Technology Transfer. The Division assists the URI Intellectual Property committee in reviewing professors' inventions or discoveries for their potential commercial application, and determining whether to seek patents on them. Once the patents are obtained, the URI Foundation negotiates licensing agreements with companies that want to use them to develop commercial products. The net profits generated from licensing goes partly to the inventors, and partly to supporting research at their departments and the University.

The College of Engineering is one of the most fertile breeding grounds for new patents and intellectual property. The College currently has 42 patents issued and pending, generating licensing fees for the University.

"The College of Engineering is definitely one of the highest producers of intellectual property on campus," noted John Topping, assistant director of the Division of Industrial Research and Technology Transfer. "Their

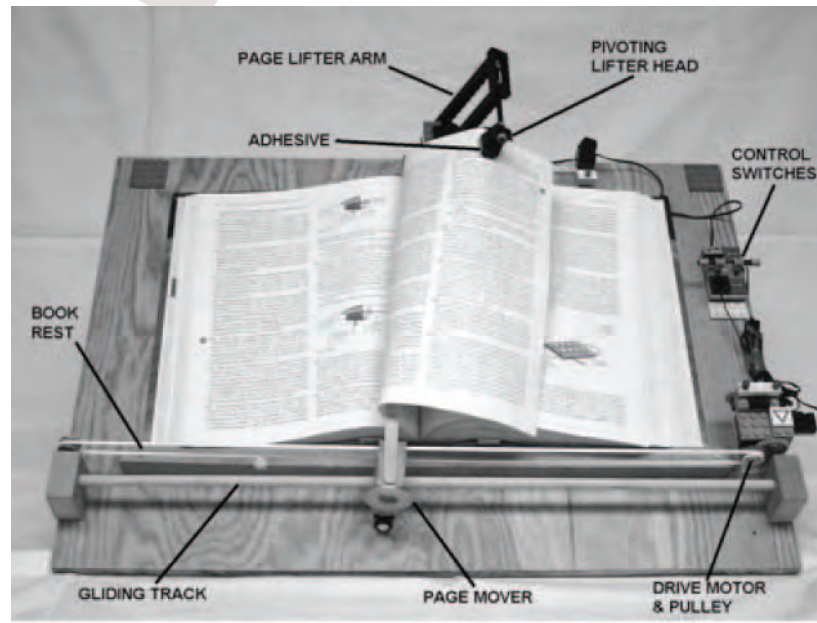
rate of discover disclosures and patents is nearly 20 percent greater than any of the other colleges."

According to URI Vice Provost of Research, Graduate Studies and Outreach Dr. Janett Trubatch, "In addition to its educational mission, the university is both mandated and devoted to making the results of research by its faculty available for products and services that can benefit society. The College of Engineering is an important partner in this enterprise."

Fostering Further Innovation

One initiative designed to spur even more innovation at the College is a new applied engineering course that will begin in the fall. The capstone design course is intended to bring together engineering students to tackle real-world engineering issues. To that end, the College has been actively seeking out companies that have design, development and manufacturing problems that they don't have the time or resources to solve. The goal is to have senior-level engineering students devise solutions as their final projects.

"It will give the students valuable experience working in multidisciplinary teams to solve real problems that companies are facing," explained



Pageturner "Alpha" prototype with labels

Dean Bahram Nassersharif.

The College hopes the program will elicit 8 to 10 problems from companies this year, and eventually grow to 50 per year.

A similar course is already in place at the College — a multidisciplinary design course focusing on assistive technologies for the physically disabled. The project-based course teams students from the College of Engineering and the College of Business Administration to design, develop, patent, manufacture and market innovative devices that will help improve the quality of life for the elderly or those with disabilities.

"One of the goals of the course is to demonstrate to both engineering and business students the importance and advantages of structuring the product design process so that business functions — marketing realities, financial characteristics, production requirements, etc. — are addressed throughout development,

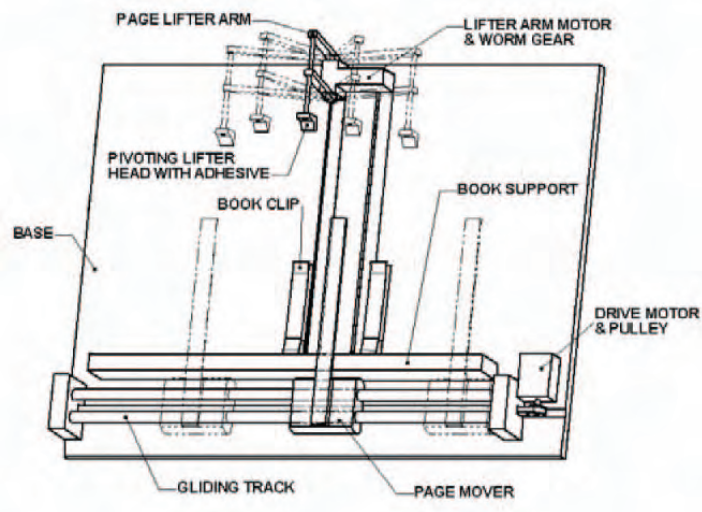


Diagram of switch-activated page turner

rather than at the end,” said Business Professor Robert Comerford, one of the teachers of the course. “This way, all these issues can be incorporated during product development, saving time and resources and shortening the time-to-market of new products.”

Engineering Professors Musa Jouaneh and Ying Sun also teach the two-semester class. It has already yielded one product concept that has received provisional patent protection — the automated page-turner, a single-switch-activated, portable device that can turn the pages of any

size hardcover book in both directions. The page-turner project also won a \$10,000 E-Team grant from the National Collegiate Inventors and Innovators Alliance (NCIIA).

The assistive devices class will soon become a permanent senior/graduate course called Rehabilitative Engineering and

Assistive Technology, and will be a requirement for the new biomedical engineering curriculum, currently under development.

Collaborating with Industry

The capstone design and assistive devices courses are part of a bigger movement towards strengthening industrial collaboration at the College of Engineering. Recently, the College formed a partnership with the Rhode Island Manufacturing Summit, a non-partisan coalition of manufacturing and business interests

founded in 2002 to create and execute policies that drive manufacturing investment and employment in Rhode Island.

According to R.I. Manufacturing Summit Executive Director Bob Flynn, the organization is currently working with the COE to develop an NSF grant program that would help support the placement of URI engineering students in the workplaces of Summit members such as Taco, Inc., Electric Boat, Cowan Plastics, Cranston Print Works, and others.

The College already has strong relationships with a number of local companies, such as Taco, one of the leading manufacturers in the HVAC industry.

“Taco and the URI College of Engineering have a deep and growing history,” said Bob Flynn, who is senior vice president at Taco as well as executive director of the Summit. “Taco has funded research and analytical projects at the College, as well as provided internship and employment opportunities for engineering students.”

Development and Characterization of Polymer Particulate Nanocomposites

Dr. Arun Shukla, URI professor of mechanical engineering, recently won a research grant to conduct research into the processing of polymer-particulate nanocomposites. The cooperative research project will address an in-depth investigation on the processing of polymer-particulate nanocomposites and their mechanical, fracture and multi-functional attributes for two different polymer systems, thermosetting resins and thermo plastics.

The project will involve the Department of Mechanical

Engineering of the Indian Institute of Technology Kanpur (IITK) and the Department of Mechanical Engineering and Applied Mechanics at the University of Rhode Island.

The constitutive response of the nanocomposites will be evaluated at high strain rates. The behavior of stationary and propagating cracks in polymer nanocomposites under dynamic conditions will be performed using ultra-high speed photography and optical interferometry. Evaluation of properties at finer length scales will be attempted leading to the

development of predictive models.

The research will involve students, technicians and faculty members from both the institutes resulting in senior projects, technical papers, presentations and theses and dissertations. The visiting faculty members and students will receive valuable exposure to the challenges of material synthesis and various experimental techniques used for mechanical and fracture characterization of novel materials.

A Better Way to Diagnosis Damage

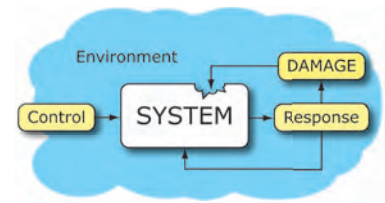
Praveena Kunaparaju

A high degree of safety and reliability is required in variety of automated systems, yet to date, there is no one perfect method or system that is capable of ensuring reliability by identifying equipment faults as they occur and predicting imminent failures of components. David Chelidze, assistant professor of mechanical engineering and applied mechanics at URI, has been working to solve the problem of damage diagnosis and prognosis.

Chelidze was responsible for establishing the nonlinear dynamics laboratory at URI, which focuses on topics in nonlinear dynamics and vibrations, including damage diagnosis and prognosis in engineered, geophysical and biological systems, failure mechanics, system and parameter identification, modal testing and analysis, dynamics and stability of engineered systems.

In September, 2003, Chelidze received a Phase I grant from STTR (Small Business Technology Transfer) to pursue "Data Driven Damage Diagnosis and Prognosis."

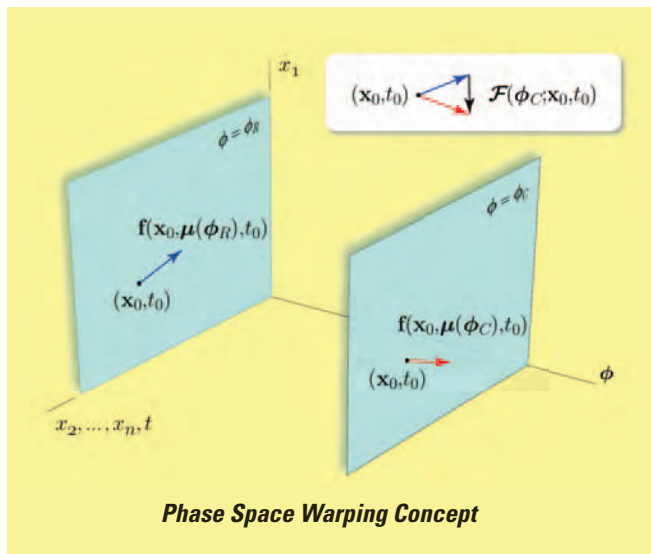
The Missile Defense Agency (MDA), a part of the Department of Defense (DoD), is funding the project, which is under the supervision of Air Force Research Office and is administered by the Naval Surface Warfare Center. The project is collaborated with Migma Systems, Inc., which is following up in the development of Damage Diagnosis and Prognosis technology and their related



Model of a Dynamical System with Damage Accumulation

composite pressure vessel (OCPV) systems used in ABL. Essentially, we want to develop the damage diagnosis system for OCPV, which will have a prognostic ability also."

The focus of the next stage is on developing data-driven, integrated damage diagnosis and prognosis technology to enable on-line, accurate and useful failure predictions for ABL systems. The developed software system will utilize advance nonlinear dynamics based signal analysis and dynamics reconstruction methods to identify active damage modes, track



Phase Space Warping Concept

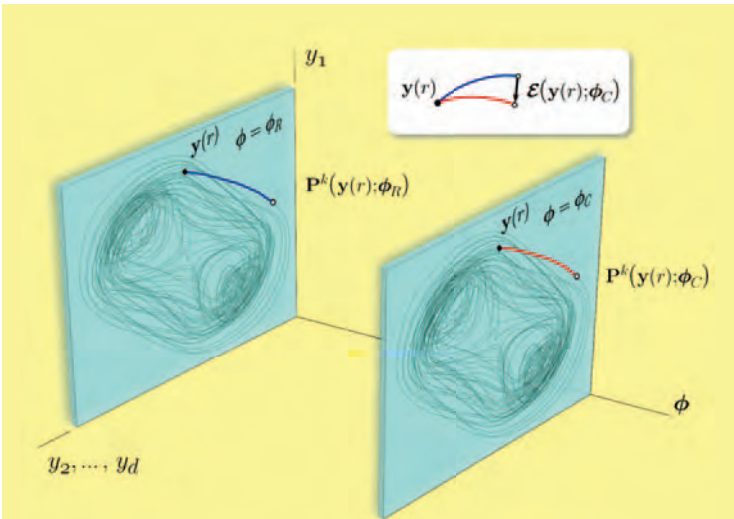
products for process predictive maintenance applications.

Chelidze says, "During Phase I of our research we developed methods capable of tracking simultaneously occurring multiple damage processes

and failure prognosis given appropriate damage models for air-borne laser system (ABL). We submitted a proposal for Phase II. The main objective during this phase is to apply these methods in collaboration with Boeing to develop an empirical damage model for their overwrapped

their evolution, develop appropriate empirical damage models and predict remaining useful life. According to Chelidze, "One of the unique aspects of our approach is that the methods developed in the lab not only can diagnose the damage but they can be used to pinpoint the active damage states, verify the theoretical damage laws or develop empirical models."

Fault diagnosis of system components, in particular, can lead to greater plant availability, extended plant life, higher quality products, and smoother system operations. Empirical modeling techniques present good estimates of reliability for similar or modified products.



Phase Space Warping Tracking Function

Improving Emergency Building Evacuation

Praveena Kunaparaju

The terrorist attacks on the World Trade Center and The Station nightclub fire have drawn new attention to the challenges of evacuating people from public buildings. Research being conducted at URI is studying how building evacuations occur with the aim toward providing insights that may serve to improve them.

The building evacuation research project began in 2002 with a grant from the National Science Foundation. Led by Natacha Thomas, associate professor of civil and environmental engineering, it is designed to address the essence and the interactions of the pedestrian evacuation behavior through a multidisciplinary effort, which involves faculty members from sociology (Benigno Auguirre, of the University of Delaware), psychology (Charles Collyer), engineering (Natacha Thomas, Manbir Sodhi), and computer science (Joan Peckham, Jean-Yves Hervé). The project is being collaborated with the Disaster Research Center at University of Delaware, which conducts field and survey research on group, organizational and community preparation for, response to, and recovery from natural and technological disasters and other community-wide crises.

Building evacuation is the study of flow of pedestrians from a building in emergency situations. Dr. Thomas, who works in the area of traffic operation that facilitates flow

of entities through transportation networks that include pedestrians, cyclists and vehicles, says, "Evacuation depends on building design, evacuation plans that are implemented and the pedestrian behavior. We are looking closer into the behavior of pedestrians to predict what kind of actions they take during the emergency situation."

Evacuation behavior during emergencies, commonly referred to as emergency egress, has three distinct analytical dimensions: the physical environment from which to evacuate, the managerial policies and controls deployed at evacuation, and the psychological and social organizational characteristics impacting the persons that participate in the movement. The project objective develops prototype software to simulate environmentally constrained and managed pedestrian motions during routine operations and emergency evacuations.

The social scientists on the team provide insights into the influence of the social organizational structure of

pedestrians on their motion-choices. Engineers account for these motion-choices in the theoretical models of pedestrian dynamics constructed. Finally, computer scientists automate the capture and the analysis of pedestrian dynamics, and develop and encode simulation models of the derived pedestrian dynamics.

The undergraduate students involved in the project are engineering and computer science majors, with some double majoring in psychology-engineering and psychology-computer science. They include David Kurowski, Collin Lieberman, Lisa Ricci, Katharine Wray, Angel Castro and Elizete Fernandez. The graduate students are Kathy Jayko, Amadou Diallo, and Marc Schraffenberger. An Eisenhower Fellow from Puerto Rico, Maria Ray-Avila, joined the undergraduate research team this summer. URI Director of Safety and Risk Management J. Kevin Culley is an enthusiastic volunteer helping the investigators, as is a former URI student, Paul Holmes, who works for Addlight/Everglow.



URI Engineering Students Compete to Win

Erika Conca

From constructing concrete canoes to operating underwater robots to sailing in the Olympics, URI engineering students were busy this past year hosting and participating in competitions that tested their minds and bodies. Following is a look at how they did.

Concrete Canoe Competition

On April 24-25, 2004, students from URI's civil engineering department participated in the annual Concrete Canoe competition. The regional competition, sponsored by the American Society of Civil Engineers (ASCE), was held at the University of Hartford in Hartford, Connecticut.

Why design a concrete canoe? "Young engineers can learn everything in the classroom, except how to respond with creativity, daring to overcome impossible challenges," said ASCE President Thomas L. Jackson, P.E., "These future engineers will be the ones to solve the problems of global water supply, energy and even space colonization, all of which will require bold and innovative solutions."

This year's URI team designed and constructed a terrific boat. "The canoe was the nicest concrete canoe we have seen constructed in as

many years as I have been involved," said Professor Ray Wright of civil engineering.

Despite the boat's excellence, the team did not achieve their goal of winning their ninth consecutive competition; instead, they placed second. The University of Massachusetts, Amherst came in first place, breaking URI's winning streak of eight consecutive wins. The team was not disappointed, however. "It was definitely a success. The participation throughout the whole competition process was very positive. It brought the students together," noted Wright.



ROV Competition

On May 8, 2004, URI's department of ocean engineering hosted the prestigious 2nd annual MATE New England Regional ROV Competition at the

University's Tootell Aquatic Center.

Brennan Phillips, an undergraduate ocean engineering senior and the president of URI's Marine Technology Society chapter, was the coordinator for this year's event. The purpose of the competition is to promote the development of technical, problem solving, critical thinking, and teamwork skills among high school students by having them design and build an underwater robotic vehicle and make it perform certain tasks.

This year's competition required participants to have their ROVs explore a mystery reef and perform seven marine science and recovery mission tasks within 25 minutes.

Ten high school teams competed, including four Rhode Island high schools: Rogers High School, South Kingstown High School, North Kingstown High School, and the Cranston Area Career and Technical Center.

Milton Academy and Falmouth Academy won top honors; Cambridge Rindge and Latin and South Kingstown High School came in 3rd and 4th place, respectively.

Asked if the competition was a success, Phillips responded, "It was a very, very successful competition. All the students had a great time. My ultimate goal would be to have it held annually at URI."

Mini Baja

The annual Mini Baja East competition took place on May 6-8, 2004 at Ski Bromont, a ski resort outside of Montreal, Canada, and was hosted by ETS (Ecole de Technologie Superieure).

The Mini Baja competitions simulate real-world engineering design projects and their related challenges.



April 25, 2004 l-r: Jen Perry, Scott Harold, Sarah Woods, Paul Scholfield, Coral Siligato, Dave Silvia, Jason Clough, Rick Macksoud, Evelyn Valerio, Anthony Pastore, Ryan Brouillette, Jen Cotugno, Sean Bolduc, Sayat Oruncakciel

Engineering students must design, build and race an off-road vehicle that will survive the severe punishment of rough terrain and water.

The Mini Baja competition lasted three days, and included safety inspections, design judging, and a four-hour endurance race. Ecole de Technologie Superieure, the winner, completed 20 laps in the four-hour race, while the URI team completed 12.

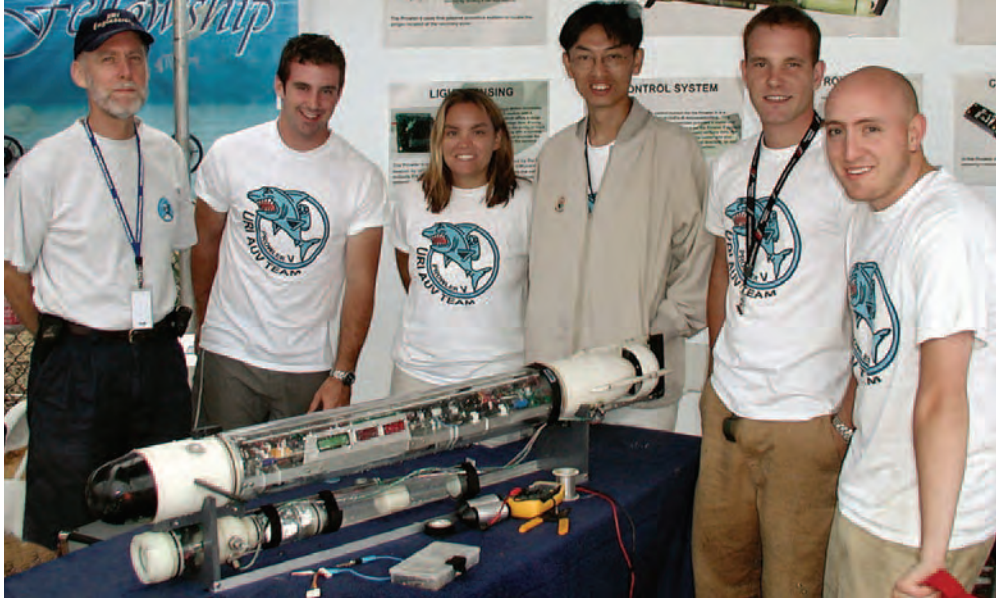
Although URI was not able to beat Ecole de Technologie Superieure, the winning team for the past two years, the team competed in every event and placed in the top half of every single competition. "We were consistent and happy with our performance," said Tanner. "The course was incredibly rough, but that only made it more interesting and more fun," he said.

According to Tanner, "There is no better thing to do in undergraduate engineering at URI. I've learned more (about engineering) in two years of working on Baja than in three years of 17 credits per semester sitting in classes... The feeling of accomplishment and achievement is much greater from Baja than from any course I've taken."

AUV Competition

On the first Sunday in August, the URI Autonomous Underwater Vehicle (AUV) team battled 18 other university AUV teams in San Diego and brought home a check for \$2000, along with the respect of the judges. They finished 4th of 18 teams behind MIT, Cornell and ETS from Canada in the 7th International AUV competition organized by the Office of Naval research and AUV Systems International (AUVSI).

Under the supervision of Drs. Robert Tyce and James Miller of ocean engineering, the team worked on developing an AUV capable of achieving all of the tasks required by



AUV Team (l-r): Professor Robert Tyce, John Corrigan, Sarah Warren, Chuen-Song Chen, Michel Beliard, Annan Moseika

the competition. The vehicle, named Prowler V, was a continuation of the vehicle developed and modified over the past four years, offering increased processing and power efficiency, durability, and reliability. The strategy for developing the Prowler for this year's competition followed the same guidelines used in the previous designs: efficiency and simplicity.

According to Dr. Tyce, the team struggled early in the week with system failures, placing 6th out of 18 in the static testing. "They roared back during the preliminary round, finishing 2nd just behind MIT with impressive consistency on the course. This after implementing a whole new optical detection system the night before, and trying out their new acoustic detections system for the first time," said Dr. Tyce.

While URI did not place first, the team was happy nonetheless. "The team learned a lot from the experience and should be very proud of its performance," said Dr. Tyce.

Chemical Engineering Student Sails into Olympics History

Chemical engineering undergraduate Tim Pitts has more on his mind than just his studies. Twenty-two-year-old Tim will be representing

the Virgin Islands at the 2004 Summer Olympics in Athens in the Laser sailing event. Tim is the first Virgin Islander to earn a spot in this event and will be the only sailor from the Caribbean in the laser event at the Athens games. Lasers are single-handed boats that are four meters long with one sail. Laser sailing requires strength, as well as tactical proficiency.

Tim was born and raised on St. Croix and is currently a junior at URI. During the past year, he took a leave from the school to pursue his dream of going to the Olympics. To qualify for the challenge, he competed in international events in Australia, Spain, France, Turkey, California, Florida and New England. His training and devotion to his goal helped him move from a rank of 600+ in the world to 197 in less than a year.



Tim Pitts

Spring 2004 Enginee

One hundred and sixty-seven students received engineering degrees at URI's 118th commencement, held on May 22, 2004.

Among the degrees bestowed upon the COE class of 2004 were the following:

- 19 chemical engineering
- 32 civil engineering
- 37 electrical engineering
- 13 computer engineering
- 7 biomedical engineering
- 4 industrial engineering
- 37 mechanical engineering
- 18 ocean engineering

Twenty-four of the engineering graduates were women; twenty were dual or triple degree International Engineering Program graduates.

In addition to degrees, awards were presented at the COE commencement. This year's awards included: The Nelson C. White,

President's, Braun-Lengyel Fellowship, and Polk Memorial Awards.

These awards are made possible through the generous contributions of URI engineering alumni and friends.

2004 Nelson C. White Awards

- ◆ David C. Twardowski, Mechanical Engineering
- ◆ Jonathan Stone, Ocean Engineering
- ◆ Sara J. Doucette, Chemical Engineering
- ◆ Stephen M. Andrus, Civil Engineering
- ◆ Kai-Chieh Yang, Electrical Engineering
- ◆ Patrick K. Martin, Computer Engineering
- ◆ John J. Coughlin, Biomedical Engineering
- ◆ Joseph B. Johnson, Industrial Engineering

2004 President's Awards

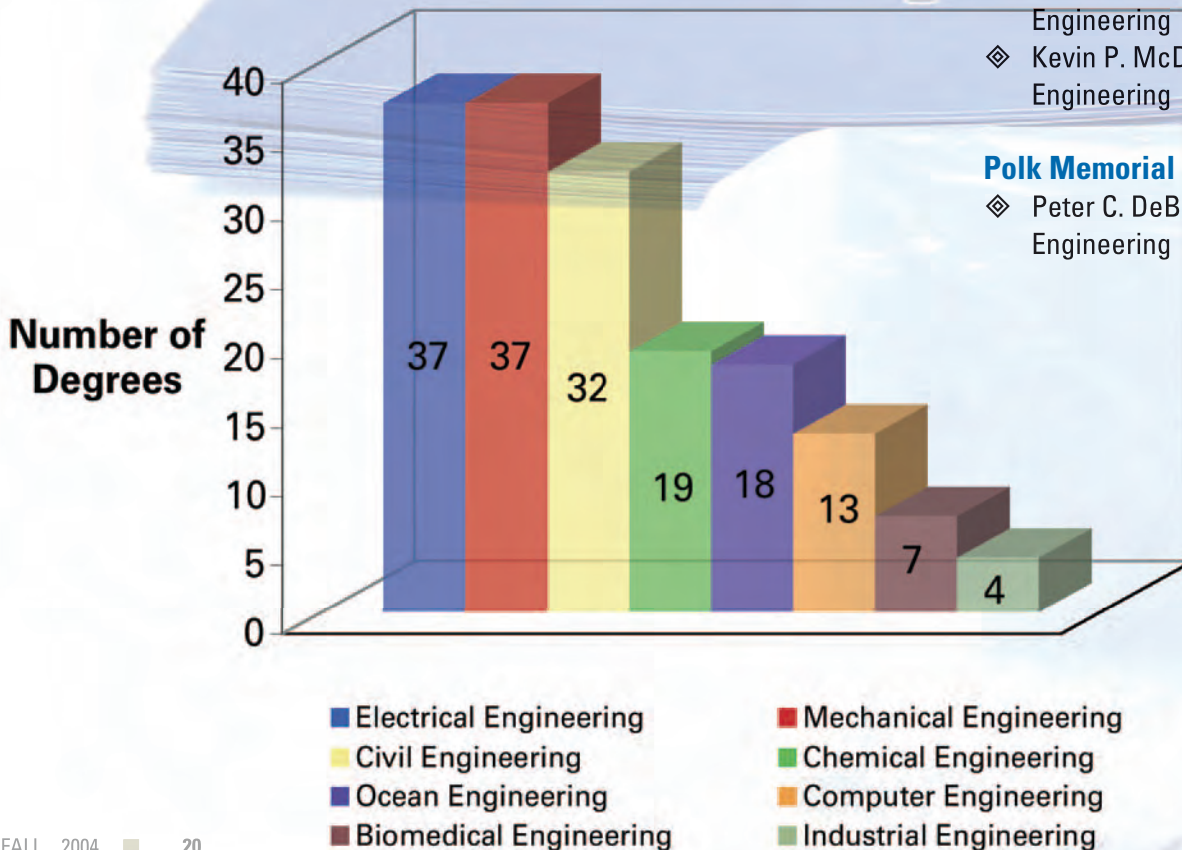
- ◆ Nevan C. Hanumara, Mechanical Engineering
- ◆ Todd J. DeMunda, Ocean Engineering
- ◆ Peter A. DiMaggio, Chemical Engineering
- ◆ Jason P. Clough, Civil Engineering
- ◆ Peter C. DeBellis, Electrical Engineering
- ◆ John DiCecco, Biomedical Engineering
- ◆ Kevin P. McDonough, Computer Engineering
- ◆ Tony B. Mendonca, Industrial Engineering

Braun-Lengyel Fellowship Award

- ◆ Kai-Chieh Yang, Electrical Engineering
- ◆ John J. Coughlin, Biomedical Engineering
- ◆ John DiCecco, Biomedical Engineering
- ◆ Patrick K. Martin, Computer Engineering
- ◆ Kevin P. McDonough, Computer Engineering

Polk Memorial Award

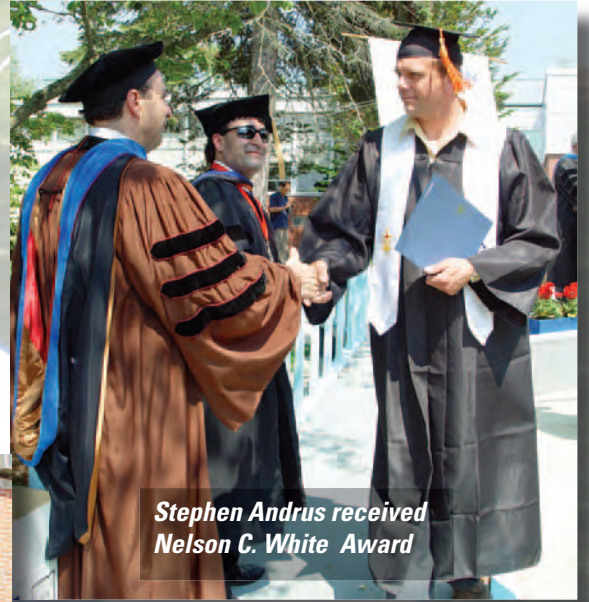
- ◆ Peter C. DeBellis, Electrical Engineering



ring Commencement



l - r: Maria Kunhardt and Ryan Lynch



Stephen Andrus received Nelson C. White Award



Katie Mellor



l - r: Prof. Grandin and Jennifer Cotugno



l - r: Michelle May and Prof. Thomas



l - r: Deans Gregory & Nassersharif congratulate Kai-Chieh Yang winner of Braun-Lengyel Fellowship and Nelson C. White Awards

URI Engineers Participate in the Titanic Expedition

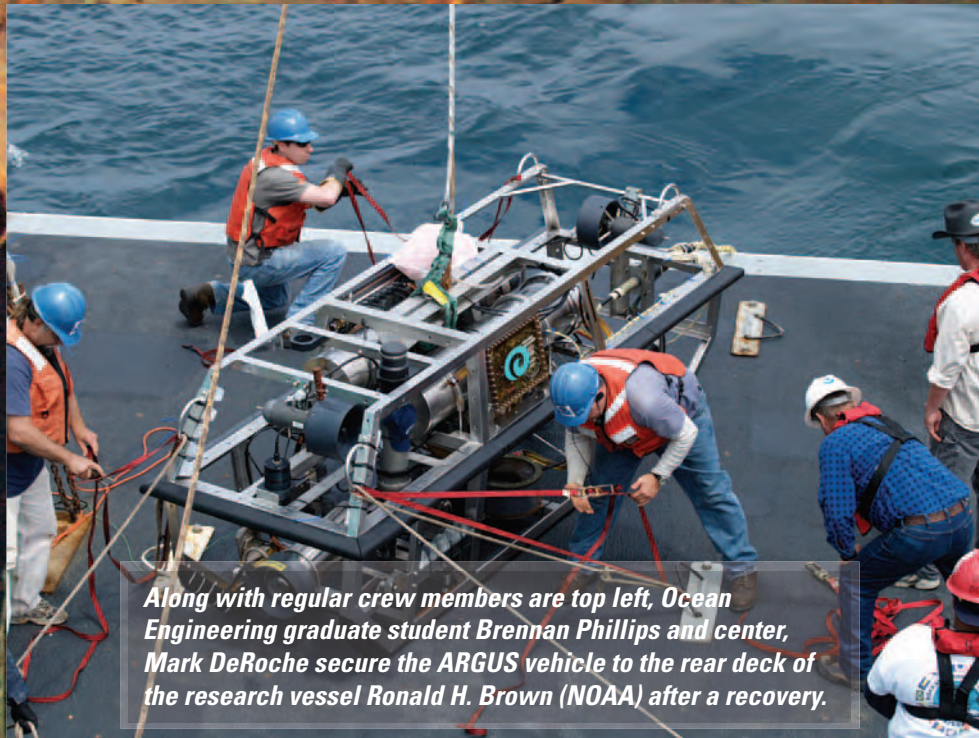
Erika Conca

Dr. Robert Ballard revisited the R.M.S. Titanic in early June 2004 for a second time to assess the state of the wreck. "We know Titanic has been naturally deteriorating over time, but I am convinced that the deterioration is being accelerated by man-made impacts as well. The 1986

photo mosaic of the ship that we created will serve as a baseline for comparative studies to determine the level of degradation that has occurred since then," said Ballard.

Ballard spent 11 days at the site mapping the ship and conducting scientific analyses of its deterioration. Two University of Rhode Island students joined Dr. Ballard on his 11-day expedition, Webb Pinner and Brennan Phillips. Webb Pinner is an ocean engineering graduate student and Brennan Phillips is a senior who just graduated from the ocean engineering department.

When asked to describe the feeling of getting the opportunity to explore with Dr. Ballard, Phillips said, "When I was growing up, Bob discovered the Titanic in 1985 and all the information was put in National



Along with regular crew members are top left, Ocean Engineering graduate student Brennan Phillips and center, Mark DeRoche secure the ARGUS vehicle to the rear deck of the research vessel Ronald H. Brown (NOAA) after a recovery.

Geographic and I'm sitting there when I was a seven-year-old saying, 'Wow, look at these beautiful pictures.' It was his discovery that got me into Ocean Engineering in the first place."

Because a Canadian company owns the salvage rights to the R.M.S. Titanic, this expedition was a "look, but don't touch mission," said Phillips. Even though Dr. Ballard discovered the wreck, he only has the right to look at his discovery.

While most would think that not being able to touch the wreck is a disadvantage, the brilliant Dr. Ballard is still able to get as close as humanly, or robotically, possible. The technology involved in such a grand expedition is Hercules, an ROV, or Remotely Operated Vehicle. In laymen terms, Phillips described the Hercules as "a robot on the end of a

string or tether controlled like a remote control car."

Hercules is Dr. Ballard's ROV and is kept at URI. Developed by Jim Newman, Ballard's chief engineer, Hercules can reach 4,000 meters deep. It has two robotic arms to pick up objects and perform

a number of valuable functions. Hercules also contains a high-definition digital camera used to go down into deep waters and take beautiful pictures.

The Titanic expedition could not be described without including the major role that engineering plays. The first role is when creating a photo mosaic of the wreck. In order to create the mosaic, Hercules must fly at a specific altitude following a specific path over the wreck two miles deep. The vehicle is capable of placing itself within 10 centimeters of a desired position.

Engineering also figures in the photos of the wreck taken by the high-definition digital camera. The sweeping images are made only possible through good piloting to create a nice camera shot.

Meghan Bellows Stands Out

By Erika Conca



Recipient of a Goldwater Scholarship, the AIChE (American Institute of Chemical Engineers) Outstanding Sophomore Award and currently number one in her class at the College of Engineering, Meghan Bellows definitely makes an impression on those around her.

Meghan chose to study engineering because in high school she was very good in math and science. What appealed to her about engineering was the fact that it includes the sciences and math that Meghan does so well at, but also has an applied aspect. She also was attracted to the many career opportunities engineering offers.

Since the summer after her freshmen year in 2002, Meghan has been working in the chemical engineering department at URI. She began on a research study on flame retardants with Dr. Stanley Barnett that year. In 2003, she switched to work with Dr. Angelo Lucia, and since then has been performing research on hydrogen fuel cells. In April 2004, Meghan presented her research at the AIChE convention in New

Orleans, Louisiana. Also this year, Meghan received the Goldwater Scholarship, established in memory of Senator Barry M. Goldwater. The scholarships, worth up to \$7,500, are bestowed each year on 300 to 400 science and engineering sophomores and juniors throughout the United States who wish to pursue a career in research.

Meghan is one of only two students in Rhode Island to have received the scholarship. She was awarded the scholarship for her work on two research projects at URI as well as her academic record (she has a 3.98 grade point average). "This scholarship was a big thing for me. It is the most prestigious undergrad engineering/science scholarship that one can obtain," said Meghan. "This scholarship showed me how I compare to other students in the nation and gave me a lot of confidence in my abilities."

Meghan is enrolled in the International Engineering Program (IEP), working toward dual degrees in German and chemical engineering.

Next year, she will study in Germany at the Technical University of Braunschweig for one semester. "I have found the IEP extremely rewarding. I love learning German and I am so excited to go abroad next year," said Meghan.

While she is eagerly looking forward to studying abroad in Germany through the IEP, Meghan also loves being at URI. A native of Pawtucket, R.I., only 35 miles away from Kingston, she has been able to stay in contact with her close-knit family. Being a recipient of a Centennial scholarship (awarded to students who demonstrate a high level of academic achievement), in addition to other outside scholarships, has also made her experience at URI enjoyable by relieving her of financial burden. Equally important, the size of URI is very appealing to Meghan. "It's not too big that I feel overwhelmed, yet I am always meeting new people," she noted.

After her semester at the Technical University, Meghan will take part in a six-month internship at BASF in Ludwigshafen, Germany, a global chemical company with business ventures in North America, South America, Africa, Asia/Asia Pacific.

Once she finishes studying abroad, Meghan will have one year left at URI. After URI, she intends to apply to graduate school. Meghan hopes to enroll in the doctoral program at Princeton University. After obtaining her Ph.D., Meghan would like to return to the University to conduct research and teach.

When she is not working or studying, Meghan does Tae Kwon Do and serves as a member of the URI Marching and Pep Bands, playing the flute, piccolo, and trumpet.

Meghan Collins Wins SWE Scholarship

Laura Nelson

URI senior Meghan Collins, currently doing her IEP internship at Siemens Medical Solutions in Madrid, was recently selected from more than 750 national applicants for the Meredith Thorns Memorial Scholarship, awarded by the National Society of Women Engineers (SWE).

SWE administers over 70 individual scholarship awards annually, varying in amount from \$1,000 to more than \$5,000 per year, and totaling more than \$200,000. SWE Scholarships are open only to women pursuing baccalaureate or graduate degrees in engineering or computer science, as well as engineering and computer science students enrolled in ABET-accredited engineering programs.

We caught up with Meghan by e-mail to discuss the achievements that led to her receiving the award, and to learn more about her plans for the future.

L.N.,
"Congratulations on the SWE scholarship. How did you manage to beat out so many other qualified applicants?"

M.C., "I attended a scholarships workshop at the SWE 2003 National Conference, and it was there that I learned about the many scholarship opportunities available through national SWE.

I felt I was qualified to apply for a SWE scholarship because of my academic record and engineering activities. I joined the URI chapter of SWE my sophomore year and became more involved by working on

a committee for the annual Minorities in Engineering Diversity Banquet, and was elected secretary for the upcoming academic year (2002-2003). As secretary I kept meeting minutes for board meetings and general meetings, helped recruit new members, cochaired the annual Minorities in Engineering Diversity Banquet, and helped plan activities for the organization. At the beginning of the 2003-2004 school year, I was elected president. During my tenure, I generated more than \$5,000 for the organization, and coordinated the participation of four students (myself included) in the National Conference in Birmingham, Ala.



Meghan Collins

I have also served as finance chair of the IEEE S-PAC, and member of the NSBE. I have a 3.78 GPA, and I have also been involved in a number of extracurricular activities, from working as a Rhody the Ram mascot to serving as a URI campus tour guide. I was also

one of 60 students chosen nationwide to present my summer research at the International Biomedical Engineering Society (BMES) Fall Meeting 2003."

L.N., *"What are your educational goals?"*

M.C., "I will graduate from URI in May 2005 with three bachelor's degrees: a B.S. in Electrical Engineering, a B.S. in Biomedical Engineering, and a B.A. in Spanish. I am unsure whether I will attend graduate school or not, but I have taken my GREs, and have been in contact with the biomedical engineering departments at Purdue, John Hopkins, and Duke. If I do attend graduate school, it will be

for a master's in biomedical engineering. Also, in the future, after working for a few years, I plan to get an MBA."

L.N., *"What are your career goals?"*

M.C., "I want to work in the medical devices and technology sector of biomedical engineering. Based on my current internship experience here at Siemens Medical

Solutions, S.A. (Madrid, Spain), I would love to work on an international level, whether it is overseas or as an international liaison. I am interested in product development, but have also developed a new interest in the international market. I plan to get an MBA eventually, and hope to hold an executive position in an international engineering company."

Nevan Hanumara: Proud to be a Rhody

Erika Conca



The University of Rhode Island has long been part of Nevan Clancy Hanumara's life. Living five minutes from campus, with a father who teaches statistics at the University and mother self-employed as psychotherapist, Nevan grew up swimming in the URI pool, playing tennis on its courts and attending its theater productions.

He first visited URI's College of Engineering during his junior year of high school at the Prout School. "I met Dean Vandeputte, heard about the International Engineering Program [IEP], and was hooked. I applied only to URI and was immediately admitted as a Centennial Scholar," he remembered. The five-year IEP program combines engineering and foreign language degrees with a half-year professional foreign internship.

Nevan began his engineering studies at URI in September 1999 and quickly fell in love with the University. Over time the Engineering Computer Center and IEP house became his second office and home. On the subject of combining two seemingly disparate fields Nevan remarked, "The liberal arts component of the French

program was an essential complement to my technical formation and provided me with a well rounded education in the classical University tradition."

"My mechanical engineering experience was entirely positive. I found the environment to be challenging yet cooperative and supportive. Teamwork is the norm and competition is more of a personal challenge than a contest. The professors' interest in and continual support of their students means that when I visit I will be coming to see not only people I respect, but friends," said Nevan.

URI's College of Engineering not only turned him into a mechanical engineer, but into a "lab rat" as well. Nevan worked for Dr. Christopher Hunter and the Transportation Research Center in the summer of his sophomore year. It was his job to monitor, maintain and collect data from cameras around the state for research into the red light running habits of Rhode Islanders.

Since the summer of 2002, Nevan has worked for Professor Donna Meyer in the Tribology and Fluid Mechanics Lab, studying the wear debris generated by artificial joint replacements, with the long-term goals of developing a joint prognosis tool and aiding in increasing joint life through improved design.

In his super-senior year, Nevan and a team of students from mechanical, biomedical, and electrical engineering developed a single-switch automated page-turner for people who lack sufficient strength and manual dexterity to hold and manipulate a book. The development came out of work in the multidisciplinary Assistive Technology course. "The device has commercialization potential and I have

just returned from a Rehabilitation Conference in Orlando where our design generated considerable interest," said Nevan proudly.

Nevan interned in France in the spring and summer of 2003 as part of the IEP program. He worked at ZF Boutheon, a fabricant of transmissions for light trucks and tour buses. "From St. Etienne, nestled in the Loire valley, I wandered around and immersed myself in the French culture," he noted. In addition, he traveled to Switzerland, England and Germany, where he visited other IEP students and attended a ZF workshop on "Interkulturelles Management" outside Friedrichshafen, the corporate headquarters. Despite all the time and energy he focused on mechanical engineering, Nevan still found time to serve as president of ASME and be involved in the Catholic Center. As a member of a South Kingstown town council-appointed committee studying the reconstruction of Route 138, he provided the perspective of both a student and a local resident.

Nevan graduated in May 2004 with a dual major in mechanical engineering and French, plus a minor in physics. His overall QPA was 3.978/4.00. His experience at URI was so positive that he believes he will someday teach at the university level. This coming fall he will start his master's degree studies at MIT, funded by a graduate fellowship, with the goal of obtaining a PhD in mechanical engineering, focusing on design and Mechatronics. "I have every confidence that URI's College of Engineering has prepared me for whatever the future may hold for me professionally, personally and globally."

A Career Engineer

Laura Nelson

Diana Hayes '79 grew up certain she'd become a math teacher, until a family friend and math teacher encouraged her to pursue a different path. "You'll be so much better off as an engineer," he assured her. Diana took his advice and never looked back. She enrolled in chemical engineering when she arrived at URI. It was a natural choice since she had always been mathematically inclined, and enjoyed chemistry.

Diana found URI active and rewarding. "The university and engineering had so much to offer," she recalls. There were many opportunities to get involved. She joined the student chapter of AIChE, and helped start the first Society of Women Engineers (SWE) chapter on campus, with classmate Gina Natale. She also was elected to Tau Beta Pi. Diana quickly adds, "It's also where I met my husband, then classmate, Daniel J. Hayes, ChE '79."

Two weeks after graduation, Daniel and Diana wed, with most of their classmates in attendance. They began working for Corning Incorporated in Central Falls, R.I., where Diana started as a process engineer. The two stayed there for 2-1/2 years, before transferring to new positions at Corning's facility in Raleigh, N.C. — the first married couple to move from one manufacturing site to another in the history of the company.

Diana loved Raleigh, not only for the climate and friendliness of the people, but for her work there. She led the process engineering team for the company's first chip (leadless) capacitor. "I loved my job at Corning," she remembers. "I worked my way up to engineering supervisor, overseeing manufacturing improvements and

productivity initiatives. My boss in Raleigh was very empowering, letting me make decisions and run things on my own. I really blossomed there."

Her career at Corning continued to grow in the following years. In 1986, Diana transferred to company headquarters in Corning, N.Y., for an assignment in corporate engineering. For the next ten years, Diana remained in corporate engineering, broadening her experiences and honing her management skills. "Corning was really committed to diversity. They were very supportive when a number of women — myself included — went out on maternity leave," notes Diana. "Among other things, that's when I learned how to manage flexible work scheduling."

Diana describes her management style as "empowering leadership." "It comes from my own positive experiences at Corning. I really rely on each individual's expertise. I like to surround myself with people who know what to do and do it well. Often in technical management there is no better way," she explains, recalling an assignment managing the company's modeling group. "My team consisted of global technology experts. Their functional expertise was unmatched. My role was to define areas of opportunity and guide the group toward meeting program objectives."

From corporate engineering, Diana moved to the company's Science Products Division in Acton, Mass., to lead the deployment of enterprise resource management technology, a major undertaking that required the redesign of the division's business processes. She then moved to the company's Optical Components Division in Marlborough as project engineering manager, charged



Diana Hayes '79

with formulating plans to improve productivity.

In 1998, after almost two decades at Corning, Diana's networking and reputation resulted in an offer from Johnson & Johnson as director of engineering for Skin and Hair Care.

At Johnson & Johnson, Diana led various groups targeting improvement of worldwide production operations and support for new product development. According to Diana, her work there was more strategic and entrepreneurial. It also required a lot of traveling to locations ranging from Greece to China to Brazil. "Working with people in different cultures is such a learning experience," says Diana. "It really brings the application of the concepts of diversity to a whole new level."

A recent restructuring at Johnson & Johnson has brought Diana to yet another opportunity point in her career. "If anything is constant, it's the need to be comfortable with change," says Diana. While being "in transition" is certainly not without challenge, Diana sees it as a time to re-energize and plan her next adventure. That's not to say she has slowed down. She is currently assisting as a partner in her husband's management consulting firm and becoming more involved in her new work with the College of Engineering's Advisory Council. Nonetheless, Diana recognizes her desire for another engineering leadership role. With her skills and experience, it's doubtful she will have to wait long.

Alumni News

Electrical Engineering

Theodore I. Blum '54 writes "It was with great deal of pride that I opened and read the entire issue of the URI Engineering Spring 2004 issue. I had previously retired as a principal of a New York City electric construction firm, W.E. Blume, Inc., after many years of exciting work projects. Retirement did not agree with me, so I returned to being an independent consultant. Another factor in returning to part-time employment is that my two thousand-watt granddaughters Elisa and Jacqueline are off to daily school."

Robert F. Barry '66 retired from Pilgrim Nuclear Power Station in 1999. He presently works for State Street Bank as a senior programmer in Web development. He lives in Plymouth, Mass.

Juan G. Alvarado '82 lives in San Jose, Costa Rica, with his wife, Patricia, and two children, Susanne, 17, and Jose David, 12. He works for the telephone company of Costa Rica.

Chemical Engineering

Elizabeth Buckley, '96 transitioned from being an application engineer into a marketing specialist supporting protein separations technologies in the biopharmaceutical market. She completed a master's degree in biotechnology/molecular biology at Manhattan College. She is married to Michael Buckley, and lives in Westfield, N.J.

Civil Engineering

Ron Russo '60 continues to operate his development company on

the shores of the Chesapeake Bay in Maryland, building condos, apartments and commercial buildings. His free time takes him to various baseball tournaments up and down the East Coast and to foreign countries to play at least 100 baseball games a year. He resides in Maryland with his wife, Boddy. His daughter Elena, a professional model, and his son, Mark, a golf professional, live nearby.

David A. Avedesian '76 lives in Silver Spring, Maryland, and works at Newport Associates, which provides facility and construction management services direct to owners.

Industrial Engineering

Bruce M. Guthrie '70 retired



Ron Russo B.S. '60 with the son of a Cuban player before Cienfuegos, Cuba game, February 2004.

from the U.S. Air Force and the N.J. Air National Guard after 33 years. During the years in the NJANG, he worked as a senior industrial engineer/senior project engineer at Coming Glass Works, General Foods Group, Lensy China Co., and Victory Refrigeration. He is currently a sheriff's officer in New Jersey.

Richard H. Hubli '79 has worked in the consumer products industry since graduation. He has two daughters, Christine, 12, and Stephanie, 8, and lives in Wilton, Conn.

Brian J. Kalberer '98 is a manager in the CRM Financial Services practice. He is primarily focused on CRM solutions and data strategy, and has more than five years experience managing, developing, architecting and implementing CRM, PRM, and e-business solutions. He lives in Boston.

Mechanical Engineering

Wesley B. Anderson '79 will retire at the end of August, 2004 from the Army after twenty-five years of service. He recently accepted the position of director of public works for the village of Lombard, Ill., where he lives.

Richard W. Turner '88, M.S. '92 launched a new business in 2003, called Convergence Data Services, a consulting and services company that helps companies clean and classify their engineering data. He and his wife live in Boston and are expecting their first child in August 2004.

Ocean Engineering

August Zilincar '99 is in charge of special design and engineering as well as designing and building custom furniture for retail and private homes at Metaline, a retail design company. He lives with his wife in Long Branch, N.J.

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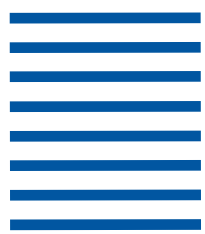


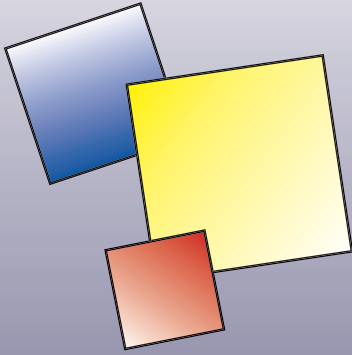
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Date	Event	Location
Friday, September 24, 2004	4th Annual Engineering Golf Outing	Beaver River Golf Club - Richmond, RI
September 30 to October 3, 2004	7th International Engineering Colloquium	Westin Hotel, Providence, RI
Wednesday, October 13, 2004	Engineering Career Day	URI, Kingston, RI
Friday, October 22, 2004	Engineering Alumni Day	URI, Kingston, RI
Friday, October 22, 2004	6th Annual College of Engineering Awards Banquet	Crowne Plaza Hotel at the Crossing - Warwick, RI

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