BENCHMARKS

SPRING 2011

IN THIS ISSUE

MEMORIAL UNIVERSITY

Faculty of Engineering and Applied Science

Welcome to the spring 2011 issue of *Benchmarks*. An important part of Memorial's mandate is to work with the community to build a stronger and more prosperous Newfoundland and Labrador, so it makes sense that over the years Memorial has built solid, world-renowned expertise in oceans-related research.

Over the past year the faculty embarked on projects aimed at addressing the conditions for success outlined in the faculty's research vision, particularly as they relate to oceans and energy. This issue of *Benchmarks* focuses on some of the outcomes of these projects. You will also read about the successes of our faculty members and students in a number of activities which support the growth and reputation of the faculty.

In February, the faculty received a combined $6.8 million from Suncor Energy and the Research & Development Corporation of Newfoundland and Labrador to build an extension on the S.J. Carew Building for a new Suncor Energy Offshore Research and Development Centre. The new centre will provide critical dedicated space for innovative research and industry collaboration related to the ocean technology and offshore petroleum sectors.

This issue is also largely about community engagement and our students. This year the faculty hosted the launch event to kick off Oil and Gas Week 2011 in the province. You will read about our first-year engineering students attending the second annual Angus Bruneau Student Leadership and Innovation Fund in Engineering (LIFE) Forum and our students continue to put Memorial's engineering school on the map by attending international competitions.

As you read through the pages, I hope you get a sense of the pride that we have in our faculty and in our achievements of the past year. I am especially proud to be part of the faculty and honoured to have served the faculty as dean *pro tempore* for the past 34 months. As I step down to become fully engaged in teaching and research, starting July 1, 2011, I'd like to take this opportunity to thank my colleagues and staff for their co-operation and support.

I welcome your comments on anything that you read in this edition, and please feel free to contact me if you would like further information on any of the stories you read in this issue.

Sincerely,
John Quaicoe, Dean *pro tempore*
jquaicoe@mun.ca

BENCHMARKS

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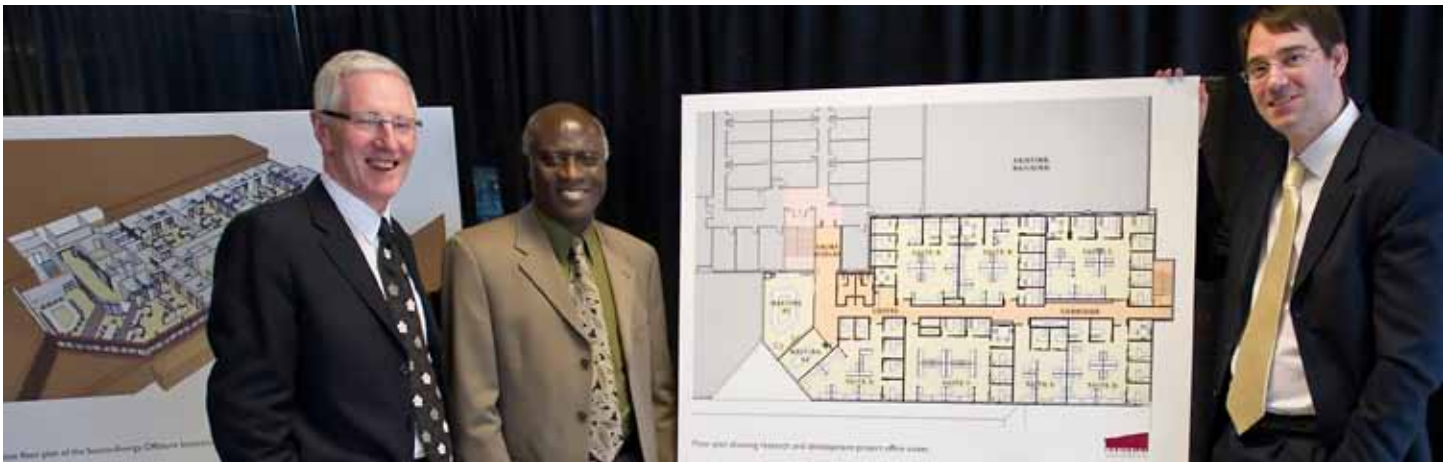
Suncor Energy and the Research & Development Corporation invest $6.8 million to build new Offshore Research and Development Centre at Memorial University



From l-r: Alan Brown of Suncor, Dr. John Quaicoe and Glenn Janes of RDC.

Offshore engineering research in Newfoundland and Labrador recently received a significant boost thanks to a $6.8-million investment from Suncor Energy and the Research & Development Corporation of Newfoundland and Labrador (RDC). The investment will expand Memorial University of Newfoundland's S.J. Carew Building, which currently houses the Faculty of Engineering and Applied Science.

Named the *Suncor Energy Offshore Research and Development Centre*, this 1,090-square-metre extension will create significant research space and a new synergy of collaboration among faculty, graduate students and industry partners.

With Memorial's rapidly growing ocean technology and offshore petroleum research programs, the new centre will provide critical dedicated space for innovative research and industry collaboration related to the ocean technology and offshore petroleum sectors – strategic investment areas for Suncor Energy, RDC, Memorial University and the province of Newfoundland and Labrador.

"We are very excited about this new expansion to the S.J. Carew Building. This generous financial support will enable us to expand and improve on existing infrastructure and create critical new space for offshore research and development. This will enable Memorial to build upon our strengths in ocean technology and to significantly advance our research and training facilities," said Dr. Gary Kachanoski, Memorial's president and vice-chancellor.

Suncor Energy's contribution builds on a long-standing relationship the company has with Memorial University. Suncor has provided funding for a number of chairs, specific research programs and investments in the Faculty of Engineering and Applied Science and the School of Music.

"The Faculty of Engineering and Applied Science is at the forefront of ocean technology and offshore research, areas of R&D vital to the oil and gas industry," said Alan Brown, vice-president, East Coast Canada for Suncor Energy. "We see this new centre as a great opportunity to help both the university and faculty continue to grow and lead the way in innovative research and development, building a legacy of expertise and competitiveness for the province."

From l-r: Glenn Janes of RDC, Alan Brown of Suncor and Dr. John Quaicoe speak at the news conference.

"Today's investment will significantly impact Newfoundland and Labrador's ocean and offshore R&D engineering for decades to come," said Glenn Janes, chief executive officer, RDC. "Creating this new critical space will allow Memorial to continue to recruit new faculty and highly-qualified graduate students to conduct research in industry-relevant areas. The development of these researchers is important to both the province and industry and a key target for RDC."

It is estimated that the new expansion will help grow Memorial's Faculty of Engineering and Applied Science R&D by $6 to 8 million per year over the next five years and will involve approximately 100 full-time equivalent researchers.

Engineering faculty members study the extension's floor plan.

"Our faculty has grown significantly over the past decade, both in enrolment and in the level of external research funding," said Dr. John Quaicoe, dean *pro tempore*, Faculty of Engineering and Applied Science. "In the past five years, our faculty has generated approximately $52 million in R&D funding, published 1,000 papers, secured 180 grants and graduated more than 200 graduate students from the program."

This new facility will provide research teams at Memorial with a new integrated space to collaborate with local technology and offshore companies. The centre will also allow the university to increase its contract research related to the ocean/offshore engineering sector and develop highly-qualified personnel in these areas.

Memorial receives new NSERC CREATE Training Program for Offshore Technology Research

From l-r: David Robbins of NSERC, David Finn of PRAC, Dr. Wei Qiu, Dr. Christopher Loomis, Glenn Janes of RDC and Darrin King, then Minister of Education.

Collaboration between Memorial University, provincial and national research agencies and the oil and gas industry will create an innovative and collaborative program for offshore technology research to address significant scientific challenges in offshore design and operations. The NSERC CREATE Training Program for Offshore Technology Research will train highly-qualified personnel for the growing offshore industry and build on the research strengths in support of Canada's research priorities in natural resources and energy, as well as the province's priority on ocean research. The program will facilitate the transition of new researchers from trainees to productive employees in the Canadian workforce.

The program will give engineering graduate students the opportunity to take specialized courses and focus research in four thematic areas: floating structures, mooring lines and risers, corrosion material engineering and subsea systems. During the period of their research, students will participate in a four-month internship with an industrial or research partner.

"The innovative nature of the program lies in providing a value-added experience to the university environment by engaging world-class research institutes and universities, leading oil and gas operators, classification societies and engineering firms. Internship opportunities with the national and international partners will help the students develop professional skills and promote interaction between academic and non-academic research environments," explained Dr. Wei Qiu, an associate professor with Memorial's Faculty of Engineering and Applied Science and principal investigator for the program.

Dr. Wei Qiu

"The oil and gas sector is moving to ultra-deepwater and harsh ice-covered regions and the challenge is to develop these resources while protecting the workers and the environment. The industry is calling for improved technology and highly-skilled workers with specialties in offshore technology to address these challenges and Memorial University is uniquely positioned to respond," said Dr. Christopher Loomis, vice-president (research) at Memorial University. "Our existing research capacity, graduate and undergraduate programs and international collaborators create the ideal environment for a program like this."

The NSERC CREATE training program has been established through generous financial support from Natural Sciences and Engineering Research Council of Canada (NSERC), Petroleum Research Atlantic Canada (PRAC), the Research & Development Corporation of Newfoundland and Labrador (RDC) as well as funding from Memorial University.

The total funding for the program is $3.55 million.

Cahill Lecture educates first-year engineering students on what to expect from an engineering degree

From l-r: Tim Harrington, Heather Beresford, Gord Breen and John Hiscock

On Thursday, March 17, Engineering One students came together for the Cahill Lecture Series. This is the second year for the lecture, which takes place each fall and caters to first-year engineering students. The lecture series provides Engineering One students (first-year students) an opportunity to hear from leading professional experts presenting on current projects relevant to their course material.

This year's lecture, titled, "Beyond the Books," offered insight into possible careers and career paths that engineering students can take upon graduation. Students also learned about a range of engineering disciplines and fields, including construction, oil and gas and consultancy. Dr. John Quaicoe, dean *pro tempore* of engineering, got things started by welcoming the students and guest speakers for coming out and thanking Cahill for organizing such an important lecture for first-year engineering students.

Speakers for this year's lecture included John Hiscock, Tim Harrington and Gordon Breen of Cahill and Heather Beresford of Technip Canada Ltd. Each spoke about their experiences after graduation and offered advice and insight to the students on what to expect upon graduation.

Cahill is an ongoing supporter of the Faculty of Engineering and Applied Science. In addition to the lecture series, in 2010, Cahill opened the Cahill Engineering One Help Centre located on the third floor of the engineering building as a resource for first-year engineering students.

Speaking of Engineering

Lieutenant Neville Lockyer

Professor Newton Amegbey

The Faculty of Engineering and Applied Science's Speaking of Engineering Lecture Series promotes engineering in Newfoundland and Labrador and raises awareness of engineering-related issues among students, the academic community and the general public. The series is an initiative of the faculty and is co-sponsored by The Professional Engineers and Geoscientists of Newfoundland and Labrador (PEG-NL) – an invaluable asset to our program and to our graduates.

In the past, this lecture series has covered many different engineering-related topics, including environment, energy, manufacturing and sustainable development and oil and gas, to name a few. In November 2010, Lieutenant Neville Lockyer, a mine warfare officer in the Fleet Dive Unit (Atlantic) with the Canadian military based in Halifax, spoke about how remotely operated vehicles (ROVs) are employed by the Canadian Navy and Canadian Clearance Divers.

Then, in April of this year, Professor Newton Amegbey came all the way from Ghana, where he is the dean of the Faculty of Mineral Resources Technology at the University of Mines and Technology in Tarkwa, to provide an overview of Ghana and its mineral endowment, including the new oil find and how the University of Mines and Technology is strategizing to play its role effectively and efficiently.

Speaking of Engineering lectures take place during the fall and winter semesters and are open to members of the university community, including faculty, staff and students, as well as people from the local community.

Faculty of Engineering and Applied Science continues to support Bridge Day

Adrian Dobre (far right) chats with students on Bridge Day.

On Saturday, March 5, the Faculty of Engineering and Applied Science was front and centre at the Johnson GEO CENTRE for National Engineering and Geoscience Month (NEGM) Bridge Day.

As with previous years, faculty members were on hand to talk to junior high and high school students about the possibilities if they choose to study engineering at Memorial and to answer questions from students and parents. Also on hand was Engineering One Help Centre Co-ordinator Adrian Dobre, who interacted with students and answered questions.

The faculty's booth was one of several at the competition, which consisted of an entire day of engineering, science and geoscience activities. Students and the public were encouraged to visit and participate in the display booths.

The event brings junior high and high school students together to test bridges that they have spent months designing and constructing using only wooden sticks and glue. High school students have an opportunity to win a Memorial University tuition voucher.

This year, more than 300 students participated from 25 schools.

Faculty of Engineering and Applied Science hosts launch event for Newfoundland and Labrador Oil & Gas Week 2011

Paul Leonard (inset) and Dr. Gary Kachanoski

On Monday, Feb. 28, the Angus Bruneau Engineering Lecture Theatre was filled to capacity with oil and gas industry executives, government officials, members of Memorial University and students and other invited guests for the province's launch of Oil & Gas Week 2011, which was Feb. 26 to March 4, 2011.

Dr. Gary Kachanoski, who brought welcoming remarks, was joined by Shawn Skinner, minister of the Department of Natural Resources with the Government of Newfoundland and Labrador, Mayor Dennis O'Keefe of the City of St. John's and Memorial Engineering Alumnus Paul Leonard of Hibernia Management and Development Company.

During the opening reception, Oil & Gas Week scholarships, valued at $1,000 each, were awarded to four post-secondary students – two from Memorial University, one from the Marine Institute and one from the College of the North Atlantic.

Newfoundland & Labrador Oil & Gas Week is a partnership event organized by the province's oil and gas industry, educational institutions and representatives from all levels of government. It is held annually to inform youth about the many exciting careers in this industry, and highlight the contributions this sector makes to the provincial economy.

Faculty hosts annual engineering conference

Conference participants at a session on Graduate Attributes.

From June 6-8, Memorial's Faculty of Engineering and Applied Science hosted the second annual Canadian Engineering Education Association (CEEA/ACEG) Conference.

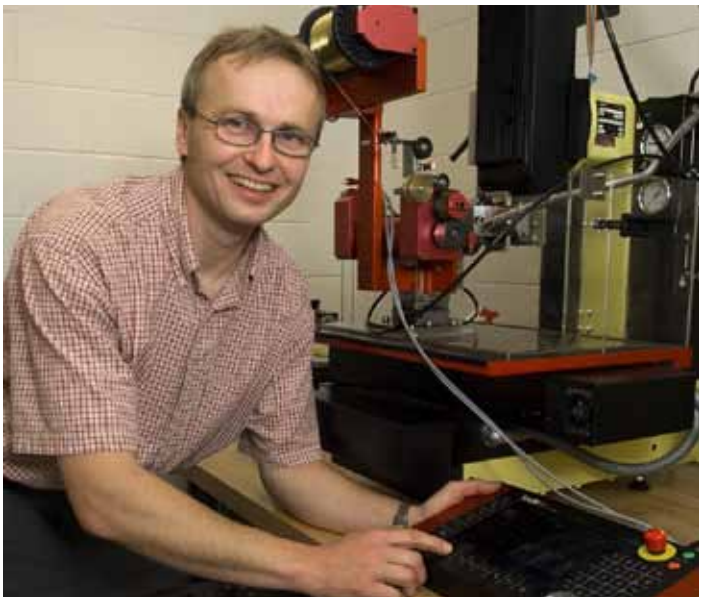
The CEEA/ACEG is an organization whose mission is to "enhance the competence and relevance of graduates from Canadian engineering schools through continuous improvement in engineering education and design education." This second annual CEEA conference continues to build on the previous efforts of the Canadian Design Engineering Network (CDEN) and the Canadian Congress on Engineering Education (C2E2).

The conference hosted 120 delegates from across the country, including engineering professors, teaching and learning centre personnel, co-op co-ordinators, librarians and graduate students. In total, 86 research papers were presented over the course of the conference along with a great deal of discussion and debate about the future of engineering education in Canada. In addition to the technical papers, there was a MINERVA Health and Safety workshop; a workshop on Canadian Engineering Accreditation Board (CEAB) defined graduate attributes; a plenary talk by Roy Stack on "The Chilean Mine Disaster Story"; and a tour of the NRC Institute for Ocean Technology. Delegates were also treated to a banquet hosted by the Spirit of Newfoundland performers as well as a reception held on campus.

Conference participants gather for some discussion.

"The conference is one of the few opportunities for engineering educators to get together to discuss the ongoing development of their courses and programs. The passion and commitment of this group is absolutely amazing and the number and diversity of initiatives that are taking place across the country is incredible. Hosting the conference this year was a great opportunity for Memorial University and a highly successful endeavour," said Andy Fisher, associate dean of undergraduate studies, Faculty of Engineering and Applied Science.

Under the sea



Dr. Vlastimil Masek

A team of university researchers will soon have a new way to observe what takes place on the ocean floor.

Led by Associate Professor Dr. Vlastimil Masek, the Ocean Network Seafloor Instrumentation Project, which commenced in 2007, is a five-year multi–disciplinary research and development project to design, fabricate and validate a seafloor array of wireless marine sensors for use in monitoring seabed processes, including applications such as geological imaging and earthquake detection.

The project team includes researchers from the Faculty of Engineering and Applied Science, as well as the departments of Earth Sciences and Physics and Physical Oceanography. The team also includes technical staff from the St. John's-based company, Rutter Inc.

The end result will be the creation of individual compact and low-cost sensors, called SEAformatics pods, which can self-power through ocean bottom currents, and communicate with each other and with the Internet, allowing observation of the ocean floor from shore.

"The overall objective is to enhance the ocean technology sector in Atlantic Canada through developing novel, environmentally neutral platform ocean technologies," said Dr. Masek. "The pod will contain ocean bottom sensor technologies for long term use in harsh marine environments; a device to harvest energy from ocean floor currents to power marine technologies; a wireless networking system to enable communication of marine data to end users and data compression algorithms to process vast quantities of seismic and other marine data."

Initially the pod was envisioned as a seismic platform targeted toward geological imaging, tsunami warnings and seismic monitoring applications. However, it has been designed with a number of generic sensor interfaces to allow the attachment of third-party equipment for use in other applications.

Examples of such alternate uses include underwater surveillance and port security or as recharge and data upload nodes to prolong deployment of autonomous underwater vehicles. The pods could also be used by oil exploration and production companies as part of a smart oilfield monitoring network.

"The traditional approach to ocean observing has utilized stand-alone moorings that were later recovered to obtain the recorded data," said Dr. Masek. "These systems provide no real-time information and do not allow end users to interact with the sensing equipment. Equipment malfunctions cannot be detected until the mooring is recovered and large data gaps result. As well, battery life on board data storage is finite, which limits deployment duration. The SEAformatics project attempts to bridge the gap between the traditional approach and cabled observatories which are costly to build and maintain and do not work well in areas where seabed conditions present a danger to the telecommunications cable."

Dr. Masek said the project is challenging, but in the end will produce a system with a broad range of applications in the ocean that will improve the understanding of the seabed and the ocean above.

Memorial receives $400,000 to further aerospace research

Dr. Siu O'Young

Memorial University recently received $400,000 US in research funding from Raytheon Company, a technology and innovation leader, to advance research into airborne sensor technology for wake detection – disturbances to the ocean surface generated by a moving vessel.

Dr. Siu O'Young, an engineering professor at Memorial University, is the principal investigator of the project and is thrilled with this new funding to advance basic and applied research in sensor technology for aerial robotic applications.

"This new collaboration with Raytheon is an important milestone in establishing an international partnership, and it will provide valuable opportunities for learning and career development for my research team, and in expanding high-tech employment for the Newfoundland and Labrador aerospace sector," he said.

Dr. Christopher Loomis, vice-president (research) at Memorial University welcomes the partnership with industry and is thrilled with the work that Memorial researchers are doing on aerospace research.

"Raytheon's investment in Dr. O'Young's lab is an excellent example of how collaborations with industry can lead to strengthened research capability and new knowledge-based products and services," said Dr. Loomis. "Dr. O'Young's work on remote sensor technology builds on existing strengths in aerospace research at Memorial and our growing engagement in this sector."

This funding is a result of Canada's Industrial and Regional Benefits policy, which requires prime contractors to make investments in the Canadian economy valued at 100 per cent of the contract value as an element of defence and security procurements made by Canada.

The Faculty of Engineering and Applied Science remembers victims and families of the 1989 Montreal Massacre

Dr. Noreen Golfman

On Monday, Dec. 6, the Angus Bruneau Engineering Lecture Theatre was filled with people who came together to remember the victims and families of the 14 women who so violently died on that date in 1989 at l'École Polytechnique in Montreal, Quebec. Each year, the event is held in the S.J. Carew Building which houses the Faculty of Engineering and Applied Science, since most of the women were engineering students.

The December 6th Vigil began with a candlelight procession of 14 students, each one representing one of the women whose lives were lost. After which, Dr. Noreen Golfman, dean of the School of Graduate Studies, delivered opening remarks followed by Dr. John Quaicoe, dean *pro tempore* of the Faculty of Engineering and Applied Science, who welcomed everyone for coming out to the Vigil. During his remarks, Dr. Quaicoe reminded everyone that it is so important for people to come together each year as a community to remember those lives that were lost in hopes that something like this never happens again.

Drs. Golfman and Quaicoe were joined by Lorraine Michael, MHA Signal Hill-Quidi Vidi, who was the keynote speaker for the evening. Ms. Michael expressed how honoured she was to be asked to participate in the Vigil for the second year in a row and how every voice is needed as we search for the answer of when it will end.

The December 6th Vigil is an annual public event held at Memorial University in the Angus Bruneau Engineering Lecture Theatre. In 1991, Dec. 6 was established as the National Day of Remembrance and Action on Violence Against Women.

Faculty of Engineering and Applied Science continues to support annual Science Fair

Dr. Eric Gill (far right) poses with this year's winners.

This past April, the 2011 Eastern Regional Science Fair took place at the Marine Institute and as in previous years, the Faculty of Engineering and Applied Science sponsored awards for best junior, intermediate and senior projects.

The best project in the junior category went to Nabil Miri and Joshua Veber of Lakecrest Independent School for their project, "Improving Detection." Archita Adluri of St. Paul's Junior High won best intermediate category for "Can we measure the quality of food using electrical properties?" And best senior project went to Andrew Bonnell and Justin Wicks of Booth Memorial High School for, "The strength of a parabola: Gold Edition."

The fair is open to more than 500 junior high and high school science students from the Eastern Newfoundland School District.

Students from Engineering Student Society "B" held Pi-Day in aid of the Janeway Children's Hospital Foundation

On Friday, March 18, students from Engineering Student Society "B" held the seventh annual Pi-Day in aid of the Janeway Children's Hospital Foundation.

For the student-led fundraiser, anyone can order a cream pie for $10 and have it delivered to anyone in the local St. John's/Mt. Pearl area. Engineering student volunteers deliver the pies to the people they have been purchased for and the recipients can then forward the pie on to someone else, at an additional cost.

This year's fundraiser event raised more than $800.

Dr. Faisal Khan is the new Vale Research Chair in Process Risk and Safety Engineering

Dr. Faisal Khan

Dr. Faisal Khan, a professor of process engineering in Memorial's Faculty of Engineering and Applied Science, is the new Vale Research Chair in Process Risk and Safety Engineering.

The chair is supported by Vale, with an investment to establish the chair, as well as a health and safety program, health and safety laboratories and student support; the Research & Development Corporation of Newfoundland and Labrador (RDC) and the Atlantic Canada Opportunities Agency (ACOA).

Associated with Memorial's Faculty of Engineering and Applied Science, the chair will expand and support the faculty's safety and risk engineering program.

"The research chair will strengthen the ongoing research, teaching and training initiative in this important area. It will also provide opportunities for students and professionals to acquire knowledge and skill in the area of safety and risk engineering, which is much desired in industry and other professional institutions," said Dr. Khan.

"The Vale Research Chair in Process Risk and Safety Engineering will help find solutions to the unique challenges faced by process industries, providing inherently safer design and operations, especially in harsh environments. This strategic investment will also enable Memorial University to assume a leadership role in safety and risk management as it relates to process engineering," said Dr. Christopher Loomis, vice-president (research), Memorial University.

"Safety is a fundamental and unassailable priority at Vale. Our goal is to reduce and ultimately eliminate all safety related incidents in our operations and to that end we are continuously evaluating and minimizing operational risks to safety. We have been working with Memorial for some time on the development of a process risk and safety engineering program and are pleased to see this becoming a reality," said Tom Paddon, general manager of Vale's operations in Newfoundland and Labrador.

Glenn Janes, chief executive officer, RDC, said this collaboration bodes well for safety and risk engineering research in Newfoundland and Labrador. He said RDC's $800,000 investment will further establish essential research expertise.

"Enhancing knowledge and skills in this growing research area will lead the way to future success and growth in our province's mineral and energy industries," said Mr. Janes. "This funding will allow Memorial researchers to develop models for risk assessment and safety management systems which can then be applied to industry ultimately allowing for safe and sustainable mineral and energy development."

"Our government believes that support for innovation is essential to secure Canada's place as a leader in the development and deployment of technological advancements in our natural resources industries," said the Honourable Keith Ashfield, Minister of National Revenue, Minister of the Atlantic Canada Opportunities Agency and Minister for the Atlantic Gateway. "That is why we continue to work with public and private sector partners to support and promote investment in innovation and leading edge research through key programs such as our Atlantic Innovation Fund."

The Vale Research Chair in Process Risk and Safety Engineering will support Memorial's long-term vision to establish a cluster of scientists and engineers focused on supporting the minerals and oil and gas industries in the province and Vale's goal to reduce and ultimately eliminate the incidence of disabling injuries and production loss at all operations and projects.

In addition to the above, the chair will develop highly trained personnel to create expertise and knowledge in the important area of safety and risk engineering, particularly in process systems relevant to mineral extraction and oil and gas processing. It will generate new data and develop advanced methodologies and models for risk assessment and design of safety measure for processing facilities. It will also develop expert tools for fault diagnosis and accident prevention in processing facilities, develop advanced systems for risk-based integrity management and loss prevention in harsh and remote operating conditions as well as develop novel methods for inherently safer process design and operations.

With a significant research record in the area of risk assessment and an international reputation in his area of expertise, Dr. Khan brings more than 15 years of experience to his position. He is also sought after by several companies from around the world to provide support and expert advice on safety and risk assessment. His research interests include safety and risk engineering, environmental risk modelling, life cycle analysis, computer-aided process-plant design and inherent safety. In addition to his professional responsibilities, Dr. Khan has authored four books and more than 150 internationally referred research papers.

New Research Chair in Petroleum Engineering

Chevron Canada Limited, the Research & Development Corporation of Newfoundland and Labrador (RDC) and Memorial University of Newfoundland have partnered to create the Chevron Chair in Petroleum Engineering at Memorial.

Under the arrangement, Chevron Canada's contribution will establish the chair position, while RDC's investment will support building research capacity in the priority area of petroleum engineering through its Collaborative R&D program.

This partnership follows an earlier announcement that Chevron Corporation had selected Memorial University to join its University Partnership Program (UPP), which provides support for higher education at over 90 schools worldwide. Memorial University is currently the only Canadian university in the Chevron UPP.

"I am delighted to make this announcement on behalf of Chevron given the importance our company attaches to both partnerships and research and development," said Mark MacLeod, vice-president (Atlantic Canada), Chevron Canada. "I am confident the new Chevron Chair in Petroleum Engineering will strengthen the capacity for petroleum engineering research and academic programs at Memorial University."

"Support for industry-relevant research and development is key to growing Newfoundland and Labrador's petroleum industry," said Glenn Janes, chief executive officer, RDC. "This new, exciting and collaborative partnership will lead to a better understanding of petroleum research and address industry challenges."

"The new Chevron Chair in Petroleum Engineering will significantly enhance our research capacity in an area of strategic importance to Memorial and the province," said Dr. Christopher Loomis, vice-president (research), Memorial University. "Our students will benefit especially from the expertise and facilities made possible by this partnership with Chevron Canada and RDC, providing them with the theoretical and practical base they need to succeed."

The chair will become an integral part of an established group of researchers and educators in the Faculty of Engineering and Applied Science. It will establish, promote and focus his/her teaching and research program on petroleum engineering. The near-term goal of the chair position will be to develop the petroleum engineering capability within the current undergraduate programs.

The chair, which should be in place by mid-2011, and associated research program will focus on one or more of the following areas: reservoir engineering, numerical simulation of reservoirs, complex well performance modelling and/or advanced well design and construction.

Research & Development Corporation and Boeing investments help create a Mechatronic Development and Prototyping Facility at Memorial University of Newfoundland

Researchers at Memorial University of Newfoundland will soon be better positioned to respond to collaborative research and development (R&D) opportunities with industry partners, thanks to $723,750 in funding from the Research & Development Corporation (RDC) and $250,000 from The Boeing Company.

New specialized R&D tools and scientific equipment will be purchased for the creation of the Mechatronic Development and Prototyping Facility at the Faculty of Engineering and Applied Science. The investment from RDC complements funding from The Boeing Company to Memorial for research on autonomous systems. RDC's funding is provided under the Research Tools and Equipment element of the corporation's April 2010 competitive call for R&D infrastructure proposals.

"Investing in critical technical and scientific equipment is vital to strengthening this province's R&D capacity," said Glenn Janes, chief executive officer, RDC. "This announcement not only supports an identified R&D

infrastructure need, but also a significant industrial partnership for this province."

Mechatronics is the integration of mechanical, electrical and computer engineering to improve the design and functionality of intelligent systems and useful products. The new facility will include the purchase of equipment to provide important technology critical to future product development and growth, including the promotion of improved designs, shorter design cycles and lower costs. The equipment will provide new capabilities that are not available to local researchers and companies within the province. This equipment has been identified as critical to future product development and growth in the province.

Investments from The Boeing Company to Memorial University are in line with Canada's Industrial & Regional Benefits (IRB) policy and are an integral part of Boeing's IRB program. Canada's IRB policy requires prime contractors such as Boeing to make investments in the Canadian economy as a result of winning defence and security contracts with the Government of Canada.

"Boeing continues to deliver on its promise to invest in the regions where it does business," said Gwen Kopsie, director of International Strategic Partnerships for Boeing Defense, Space & Security. "For nearly 100 years we have been a vital partner to Canada. We remain committed to working with local education and research institutions to advance the capabilities of Canadian industry to continue competing in the global aerospace and defence market and providing long-term, high-value jobs to Canada's work force."

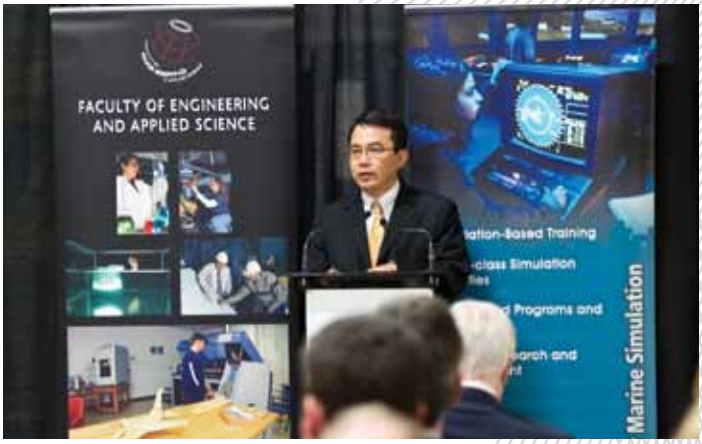
The new facility will be a key component supporting collaborative R&D between Memorial University and The Boeing Company. It will also serve the specialized needs of researchers and other industrial partners whose focus is Autonomous Unmanned Vehicles (AUV).

"The new facility will enable researchers at Memorial to quickly manufacture functional, mechatronic systems that are suitable for deployment on Unmanned Aerial Vehicles (UAV) and other autonomous platforms. The goal is to achieve a significant reduction in the product development time of advanced sensor technology and other intelligent systems that will ultimately improve UAV autonomy and reliability," said Dr. Nicholas Krouglicof, an associate professor in Memorial's Faculty of Engineering and Applied Science and the principal investigator responsible for the new facility.

"The investments made by RDC and The Boeing Company will open up new and important collaborative opportunities, including those with local companies whose current and future successes are inextricably linked to advanced R&D," said Dr. Christopher Loomis, vice-president (research) of Memorial University. "Our participation in and our contributions to their successes will be enhanced significantly by the new Mechatronic Development and Prototyping Facility."

The new facility is set to open in late 2011.

Faculty of Engineering and Applied Science receives investment in ocean technology from the province



Dr. Wei Qiu

Memorial University is expanding its capacity to service the growing demands of the global ocean technology sector with a $400,000 investment from the provincial government.

The investment, which is supported through the Department of Innovation, Trade and Rural Development's (INTRD's) OceanTech Intelligence Program, which was established under Oceans of Opportunity and designed to advance initiatives focused on growing Newfoundland and Labrador's ocean technology sector, will enable Memorial University's Faculty of Engineering and Applied Science to upgrade a tow tank located in the Ocean Engineering Research Centre (OERC).

"The OERC has leading expertise in the areas of engineering design for harsh environments, Arctic engineering, marine hydrodynamics, marine and offshore structures, offshore engineering and safety, autonomous ocean systems and ocean sensor technologies," said Dr. Wei Qiu, director of OERC.

"OERC researchers lead many large projects funded by the offshore industry, government agencies and national and international partners. In keeping with Memorial's strategic plan, OERC would like to continue advancing its capability to address the challenges in ocean technology and offshore research. This funding and the $100,000 commitment from the Faculty of Engineering and Applied

From l-r: Dr. Christopher Loomis, Dr. Wei Qiu and Minister Susan Sullivan on equipment in the Faculty of Engineering tow tank. Also pictured is Engineering Technologist Trevor Clark.

Science will be used to upgrade the tow tank's wave making system and to develop the flow visualization capability and the advanced measurement systems. The renewed facility will meet the increasing demands from industry and academia in the growing area of ocean technology," Dr. Qiu added.

The Government of Newfoundland and Labrador is an active supporter of initiatives that strengthen ties between educational institutions and industry. "Globally, businesses operating in ocean-related industries are seeking innovative technologies and services that allow them to better-operate vessels and offshore platforms in harsh environments," said Minister Sullivan. "Memorial University over the years has positioned itself as a leading source for such technologies and services – both through its tow tank and marine simulators. This investment will enable it to continue to expand its scope of services to meet industry needs."

Professors in the Faculty of Engineering and Applied Science receive federal funding to advance offshore research

Two engineering professors, Drs. Brian Veitch and Nicholas Krouglicof, received a combined $4.8 million from Atlantic Canada Opportunity Agency (ACOA) through the Atlantic Innovation Fund (AIF) for projects related to the offshore.

Dr. Veitch will receive $2.6 million for his project on virtual environments for knowledge mobilization to further refine and develop simulator technologies and collaborative virtual environments that train workers in the offshore petroleum and shipping industries to improve safety of life at sea. Dr. Veitch, along with Dr. Scott MacKinnon

AIF funding recipients, including Dr. Veitch (second from left, back row) and Dr. Krouglicof (second from right, back row).

of the Department of Human Kinetics and Recreation, will lead an experienced multi-disciplinary R&D team based at Memorial, which will include the Marine Institute, Defense Research and Development Canada and the National Research Council of Canada. The research team will investigate linkages between learning and the level of presence produced by simulation and virtual environments. Also, in collaboration with Virtual Marine Technologies (VMT), it will advance existing emergency response training simulation prototypes to commercially ready production systems.

Dr. Krouglicof received $2.2 million for his project on intelligent sensor platforms for remotely piloted vehicles to support autonomous decision-making/operation of unmanned vehicles. Dr. Krouglicof will lead the project to develop intelligent cameras and laser scanning systems. The objective is to achieve high reliability, low power consumption and real-time performance through the integrating of image sensing, acquisition, and processing within a single enclosure. The systems will meet the needs of industries which require monitoring in marine, harsh or remote environments, as well as those engaged in surveillance and security applications. A parallel research effort will focus on the development of an underwater 3D vision system that provides high dimensional accuracy for underwater inspection or marine structures and biological observation.

The Atlantic Innovation Fund is meant to enhance Atlantic Canada's ability to carry out leading-edge R&D and to bring new knowledge, jobs and business opportunities to the region. Among Atlantic Canadian universities, Memorial ranks first in AIF funding.

Engineering professors receive funding under a new NSERC grant

Drs. Faisal Khan and Kelly Hawboldt with Memorial's Faculty of Engineering and Applied Science didn't waste any time applying for a new grant through the Natural Sciences and Engineering Research Council of Canada (NSERC) to advance research to advance the world in which we live.

The new Engage Grants (EG) Program is intended to give companies that operate from a Canadian base access to the unique knowledge and expertise available at Canadian universities. The program is intended to foster the development of new research partnerships between academic researchers and companies that have never collaborated together before, by supporting short-term research and development projects aimed at addressing a company-specific problem.

The Safety and Risk Engineering group at Memorial is a leading research team in the area of fault diagnosis, failure analysis and risk assessment in offshore oil and gas and process industries. Dr. Khan heads up this team and his project aims to develop a new collaborative research partnership with Mad Rock Marine Solutions Inc. (MRMS) to apply the in-house knowledge and expertise to do a risk analysis of MRMS's new generation of RocLoc series of lifeboats release hooks. These hooks are known to fail in demand, and since their demand comes during an emergency situation, failure to function is of serious consequences.

Dr. Faisal Khan

Dr. Kelly Hawboldt

"The International Maritime Organization (IMO) has made it mandatory to do detailed risk assessments on all advanced lifeboat release hooks. My project will aim to do a detailed risk assessment of Mad Rock Marine Solutions Inc.'s RocLoc hook," explained Dr. Khan.

Dr. Khan will receive $24,500 over the next six months to further develop a joint project with Mad Rock Marine Solutions Inc. on advanced hooks for lifeboats. The money will be used to hire an engineering co-op student and to purchase advanced software tools to do the risk analysis.

Dr. Khan says he applied for this grant to share the expertise with local industries and to fill the knowledge gap. He explained that projects such as this help to develop a close collaboration with local technological based industries. Such collaboration help to undertake real life applied research and it provides a competitive edge to the industry having access to technical expertise.

"There is a real need and lack of expertise available in the area of safety and risk analysis. This success is attributed to continuous support and motivation from the Faculty of Engineering and Applied Science at Memorial to undertake applied research lead by the associate dean (research)," explained Dr. Khan.

Dr. Hawboldt will receive $20,500 to work with Martec Limited, a leading Canadian engineering firm specializing in advanced engineering simulation technology for the design and analysis of complex structures and systems, such as aircraft and ships, to develop a model to predict combustion efficiency and predict emissions for gas inventories and linking to plume dispersion models.

"This is something I'm very interested in but lacked the computational fluid dynamic (CFD) expertise, which Martec has and they were interested in this but lacked the chemistry and oil and gas background, which I have," explained Dr. Hawboldt.

"Martec has a really strong research group in CFD modelling, which is basically modelling complex fluid flows (gas and liquid). For instance, they can model how fires and gases disperse in explosions or fires, so they can predict how the fire will travel or how the explosive gases might transport in the atmosphere. Together, we will try to model the flare in offshore oil and gas platforms. Flares are used under emergency shut down or pressure situations where you have waste gas that you need to relieve to prevent an accident but the thicker combustion efficiency is difficult to predict and the combustion determines the dispersion and the type of emissions," she added.

In addition to developing a CFD model-to-model flare, a tool to predict key contaminants and combustion efficiency will be critical in operation and design. Better predictions would optimize this process and possibly save operators fuel gas and decrease emissions. Most mass tend to either over- or under-predict emission and combustion efficiency. The development of a predictive tool will allow for better predictions of emissions and combustion and result in lower management costs, directed treatment systems, and mitigation of environmental impacts. Also,

should any CO2 management be required, the tool will give better predictions of CO2 emission. This work is a necessary part to any sustainable development related to oil and gas operations.

Memorial renames campus building in Dr. Angus Bruneau's honour

From l-r: Tom Paddon of Vale, Dr. Angus Bruneau and Dr. Stephen Bruneau.

Memorial University and Vale celebrated the ongoing legacy of one of Newfoundland and Labrador's most outstanding citizens in the field of engineering and research-based innovation by renaming a building on the university's St. John's campus in his honour this week.

The Inco Innovation Centre was renamed as the Bruneau Centre for Research and Innovation after Dr. Angus Bruneau, Memorial's founding dean of the Faculty of Engineering and Applied Science, during a special ceremony. The large, well-utilized lecture theatre in the building will now be known as Innovation Hall.

Memorial University President and Vice-Chancellor Dr. Gary Kachanoski, Vale General Manager Mr. Tom Paddon and numerous special guests joined Dr. Bruneau and his family – including his son, Memorial engineering professor Dr. Stephen Bruneau – to recognize Dr. Bruneau's many contributions to Memorial and to Newfoundland and Labrador.

Dr. Angus Bruneau has a close and multi-faceted relationship with Memorial. His tenure as dean of the Faculty of Engineering and Applied Science from 1968-1974 saw the development of the co-operative education program – one of only two such programs offered by Canadian universities at the time. Upon his 2006 retirement as chair of the board at Fortis Inc., Dr. Bruneau's colleagues at the corporation contributed $100,000 towards the renovation the main lecture hall in the university's S.J. Carew engineering building. The lecture hall has since been known as the Angus Bruneau Engineering Lecture Theatre.

Dr. Bruneau is also a tireless volunteer in several capacities at Memorial as well as a longtime donor. In 2007 the university was the recipient of a generous $1 million donation from Dr. Bruneau and his wife Dr. Jean Bruneau. The gift continues to fund the Angus Bruneau Student Leadership and Innovation Fund in Engineering, which provides life-changing opportunities to students in Memorial's Faculty of Engineering and Applied Science.

"There is no better way to acknowledge Dr. Angus Bruneau's outstanding 40-year career, one that was strongly focused on technology-based innovation and research, than by renaming the Inco Innovation Centre to the Bruneau Centre for Research and Innovation," said President Kachanoski.

> *"This is a great honour for my father and we, as a family, are humbled and touched by this profound gesture of appreciation."*
>
> Dr. Stephen Bruneau

Mr. Tom Paddon, general manager of Vale Newfoundland and Labrador, said Vale has always appreciated Memorial's tradition of naming its buildings after noteworthy citizens. And, as a key member of Inco's board of directors during the purchase of Voisey's Bay in 1996, Dr. Bruneau came top of mind when discussions with Memorial began on the need to rename the Inco Innovation Centre following Vale's acquisition of Inco.

"Dr. Bruneau played an important role in advancing the Voisey's Bay development during a very challenging period," said Mr. Paddon. "We are very pleased to see that his drive and commitment to research and innovation has been captured by Memorial in such a meaningful and respectful way."

Dr. Stephen Bruneau, offered words of appreciation for the gesture on behalf of his father and his family.

"This is a great honour for my father and we, as a family, are humbled and touched by this profound gesture of appreciation," said Dr. Stephen Bruneau. "That Memorial and Vale would collaborate to dedicate this university building in his name was entirely unexpected and a great surprise. Though the motivation for his life's work did not contemplate this kind of recognition, it is a meaningful and lasting symbol of it and something for which we are deeply honoured."

RESEARCH at its best

It's been another busy year for our faculty members. Between their teaching commitments and research, engineering professors generated more than $16 million in external research funding over the past year. In addition to what our faculty members secured, the Faculty of Engineering and Applied Science received $6.8 million from Suncor and the Research and Development Corporation of Newfoundland and Labrador (RDC) to expand the S.J. Carew Building to create significant research space and a new synergy of collaboration among faculty, graduate students and industry partners. Below is an overview of the research projects some of our faculty members are involved in and research funding secured over the past year.

Suncor and the Research and Development Corporation of Newfoundland and Labrador (RDC):

The Faculty of Engineering and Applied Science received $6.8 million to expand the S.J. Carew Building to create significant research

Natural Sciences and Engineering Research Council of Canada (NSERC):

Discovery Grants - March 2011

Dr. Yuri Muzychka received $27,000 for "Heat transfer and fluid flow in compact energy systems and microelectronics cooling devices."

Dr. Shafiq Alam received $21,000 for "Recovery of gold from dilute solutions by using some biomass wastes."

Dr. Stephen Butt received $21,000 for "Remote characterization of geological and geotechnical materials and structures."

Dr. Yan Zhang received $21,000 for "Development of cost-effective and environmentally friendly technologies for the production of pharmaceuticals and biofuels."

Dr. Shawn Kenny received $19,000 for "Mechanical integrity of buried energy pipelines."

Dr. Lesley James received $19,000 for "Quantification of the concentration dependent diffusivity and dispersivity of light hydrocarbons in heavy oil."

NSERC-DND Research Partnership Program DRDC

Dr. Siu O'Young received $100,000 for "Autonomous Collision Avoidance System for Small Unmanned Aerial Vehicles."

Discovery Grants - March 2010

Dr. Brian Veitch received $160,000 for "Hydrodynamic loads on azimuthing propellers."

Dr. Theo Norvell received $125,000 for "Automated verification of concurrent programs for embedded systems."

Dr. Martin Ordonez received $115,000 for "Fuel cell hybrid schemes for renewal flex power generation."

Dr. Siu O'Young received $120,000 for "Collision assessment for UAV."

Dr. Eric Gill received $130,000 for "The scattering of high frequency electromagnetic radiation from rough surfaces-theory and application to surface wave radar as an ocean remote sensor."

Dr. Bipul Hawlader received $100,000 for "Modeling of buried pipelines subjected to ground movement."

Dr. Tahir Husain received $20,000 for "Environmental decision-making under uncertainty."

Engage

Dr. Amy Hsiao received $25,000 for a joint project with Lotek Wireless Inc. for "Monitoring the environment: materials properties and selection in the development of novel biotelemetry devices."

Dr. Faisal Khan received $25,000 for a joint project with IDBLUE for "Human error probability assessment during maintenance procedure."

Dr. Faisal Khan received $24,500 for a joint program with Mad Rock Marne Solutions Inc. for a project on second-generation lifeboat release hooks.

Dr. Kelly Hawboldt received $20,500 for a joint project with Martek Limited on flare modeling on offshore platforms.

Collaborative Research and Training Experience (CREATE):

Drs. Wei Qiu, Shawn Kenny, Ray Gosine, Brian Veitch, Claude Daley, Heather Peng, Steve Bruneau, Faisal Khan, Yuming Zhao, Ralf Bachmayer and colleagues from other faculties and institutions received $3.24 million for an Offshore Technology Research Training Program.

Industrial Research and Innovation Fund (IRIF) Grants:

Dr. John Quaicoe, along with Dr. Lawrence Cochrane of the Inco Innovation Centre, received $800,000 for "Process Risk and Safety Engineering Chair."

Drs. Lihong Zhang, Howard Heys and John Shirokoff received $276,977 for "emSYSCAN – Embedded Systems Canada."

Dr. Claude Daley received $800,000 for "STePS2 – Sustainable Technology for Polar Ships and Structures."

Mathematics of Information Technology and Complex Systems (MITACS):

Dr. Hesham Marzouk received two MITACS awards for $75,000 for "Structural Health Monitoring of Offshore Structures using Fiber Bragg Gratings."

Dr. Ian Jordaan received $30,000 for "Ice-Induced Vibrations on Offshore Structures." (Part of this funding came from C-CORE.)

Dr. Kelly Hawoldt received $15,000 for "Inventory of Biomass Suitable for Conversion to Biofuels/Chemicals and Most Promising Conversion Options." (Part of this funding came from CFSI)

Dr. Octavia Dobre received $15,000 for "Further Development on Spectrum Sensing and Awareness for Cognitive and Intelligent Radios: Algorithm implementation, integration and testing."

Dr. Eric Gill received $15,000 for "Aspects of Current Measurement with Single-Site Long Range High Frequency Radar."

Dr. Kelly Hawboldt, along with Dr. Helleur from the Faculty of Science, received $15,000 for "Inventory and Characterization of Biomass Suitable for Conversion to Biofuels/Chemicals and Most Promising Conversion Options." (They also received $15,000 from the provincial Dept. of Natural Resources or this project.)

Atlantic Innovation Fund (AIF):

Dr. Brian Veitch, along with his colleague in Human Kinetics and Recreation Dr. Scott MacKinnon, received $2.6 million to further refine and develop simulator technologies and collaborative virtual environments that train workers in the offshore petroleum and shipping industries to improve safety of life at sea.

Dr. Nick Krouglicof received $2.2 million to support autonomous decision-making/operation of unmanned vehicles by developing intelligent cameras and laser-scanning systems.

Harris Centre:

Dr. Mohamed Ahmed received $10,000 for "Wireless Sensor Networks for Forest Monitoring in Newfoundland and Labrador."

Dr. Shafiq Alam received $10,000 for "Bioremediation of Toxic Metals in Mine Sites."

Petroleum Research Atlantic Canada (PRAC):

Dr. Kelly Hawboldt received $39,500 for "Membrane Contactor for Offshore Gas Treatment."

Defense, Research and Development Canada:

Dr. Octavia Dobre received $78,240 for "Signal Classification Techniques."

Industry Canada:

Dr. Octavia Dobre received $28,000 for "Investigation of the Trade-offs required for Efficient, Adaptive Spectrum Access in Heterogeneous Environments."

Innovation, Trade and Rural Development:

Dr. Wei Qiu received $400,000 for upgrades to the Ocean Engineering Research Centre's tow tank.

Oceanic Consulting Corporation:

Drs. Wei Qiu and Heather Peng received $117,621 for "Development of Numerical Models and Computer Source Code to Simulate Motions and Forces Within Mooring and Riser Systems for Offshore Structures."

Raytheon Company

Dr. Siu O'Young received $400,000 to further aerospace research.

RESEARCH NEWS

The Boeing Company:

Dr. Nicholas Krouglicof received $723,750 from the Research and Development Corporation of Newfoundland and Labrador (RDC) to purchase new specialized R&D tools and scientific equipment for a new Mechatronic Development and Prototyping Facility to be located in the faculty. (Dr. Krouglicof also received $250,000 from The Boeing Company.)

Dept. of Environment and Conservation (IBES):

Dr. Leonard Lye received $29,761.59 for "Low flow frequency study for Newfoundland and Labrador."

Provincial Dept. of Natural Resources

Dr. Mohamed Ahmed received $15,000 for "Forest Monitoring Using Wireless Sensor Networks."

Environment Canada:

Dr. Bing Chen received $12,000 for "An Enhanced In-situ Produced Water Treatment Method for Offshore Oil and Gas Production."

NEW DEAN *pro tempore*

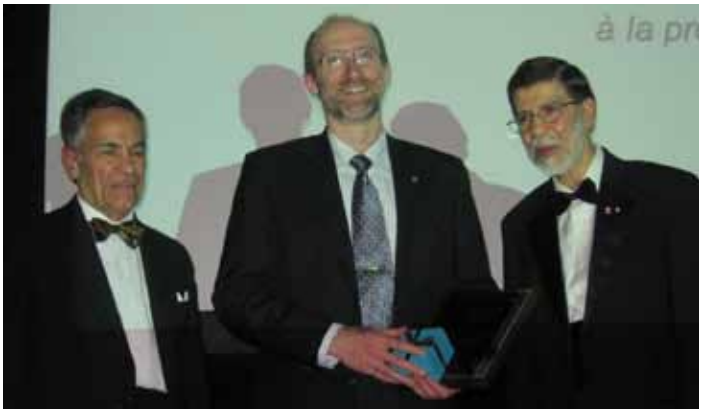
New dean *pro tempore* for Faculty of Engineering and Applied Science

As of July 1, 2011, Memorial's Faculty of Engineering and Applied Science will have a new dean *pro tempore*. The Board of Regents of Memorial University has appointed Dr. Ramachandran Venkatesan as the new dean *pro tempore*. Dr. Venkatesan replaces Dr. John Quaicoe, who has decided to step down as dean *pro tempore* to make more time for his passion, which is teaching.

Dr. Ramachandran (Venky) Venkatesan is a professor of computer engineering in the Faculty of Engineering and Applied Science. Since joining Memorial in 1987 as an assistant professor of electrical engineering, he has served in several leadership roles. He was chair of the electrical and computer engineering discipline for four years, associate dean of graduate studies and research for five years, interim associate dean of undergraduate studies for approximately one year and acting dean for six months before Dr. Quaicoe took on the position.

Dr. Venkatesan will lead the faculty until a permanent dean is appointed.

IEEE Merit Award



From l-r: Om Malik, then IEEE president; Dennis Peters and Hussein Mouftah, 2010 Chair of the IEEE Canada Awards & Recognition Committee.

In May 2010, Dr. Dennis Peters received the IEEE Canada J.J. Archambault Eastern Canada Merit Award in recognition of his dedicated and distinguished service in the engineering profession.

President's Award

From l-r: Dr. Mahmoud Haddara and Dr. Gary Kachanoski

Dr. Mahmoud Haddara received the 2010 President's Award for Exceptional Community Service. Dr. Haddara received the award in recognition of his contributions to the province's religious and cultural community.

New Staff

Nicole Devereaux
accreditation clerk (undergraduate studies), June 2010

Cheryl Keough
student Liaison officer (undergraduate studies), June 2010

Stephanie Butt
programmer consultant, September 2010

Mohammad Nashbat
engineering technologist, October 2010

Kaela Barrington
intermediate clerk stenographer, November 2010

Cathy Baker
academic program assistant (undergraduate studies), January 2011

Michelle Corbett
secretary (graduate studies), January 2011

Glenn St. Croix
engineering technologist, February 2011

Jeff Cull
intermediate clerk, March 2011

Elizabeth Parsons
intermediate clerk stenographer, March 2011

Milestones

30 years of service

Moya Crocker, academic program administrator (Graduate Studies), May 2011
Alvin Kenny, administrative staff specialist, May 2011
Richard Niefer, associate professor, May 2011

25 years of service

Dr. Katna Munaswamy, professor, May 2011

20 years of service

Yvonne King, secretary, May 2011
Valerie Mercer, computer operator, May 2011
Dr. Cecilia Moloney, professor, May 2011

15 years of service

Dr. Seshu Adluri, professor, Sept. 2010
Dr. Claude Daley, professor, Sept. 2010
Dr. Howard Heys, professor, Sept. 2010
Dr. Tahir Husain, professor, Sept. 2010
Dr. Theodore Norvell, associate professor, Sept. 2010

10 years of service

Dr. Cynthia Coles, associate professor, Sept. 2010
Dr. Eric Gill, professor, Sept. 2010
Dr. Kelly Hawboldt, associate professor, Sept. 2010
Dr. Amgad Hussein, professor, Sept. 2010
Dr. Faisal Khan, professor, Sept. 2010
Dr. Yuri Muzychka, professor, Sept. 2010

Big boost for student researchers

Recipients of the Ocean Industries Student Research Awards at a reception on Nov. 2, 2010. (Photo courtesy of RDC)

More than $1 million in funding is helping Newfoundland and Labrador attract and retain 22 top student researchers, thanks to funding from the Research & Development Corporation (RDC).

The students are the recipients of RDC's Ocean Industries Student Research Awards. In total, eight doctoral, 12 master's and two undergraduate students at Memorial University received $1,037,000 in support of their ocean research over a three-year period. The awards ranged in value from $7,500 per year for undergraduate research to $20,000-$30,000 per year at the graduate level. The students' research supervisors also received a research allowance to support their supervisory work.

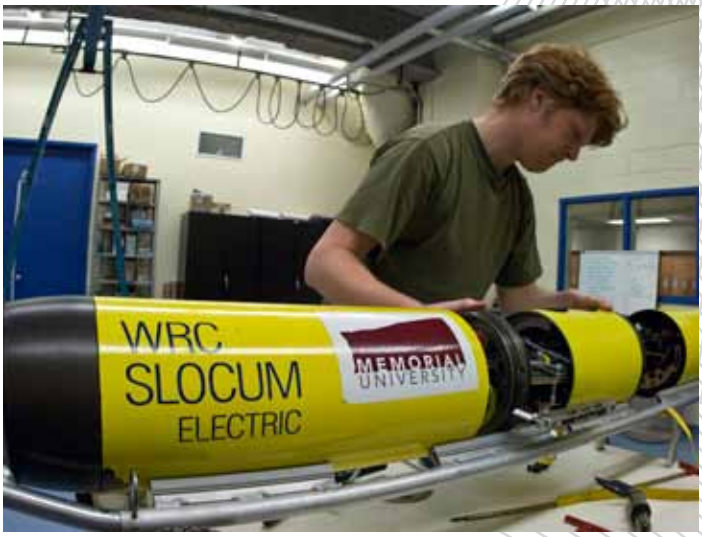
The investment supports research in areas relevant to Newfoundland and Labrador's ocean industries including offshore petroleum, ocean engineering, marine safety, fisheries and aquaculture and marine science. The students are enrolled in the Faculty of Engineering and Applied Science, Faculty of Science and the School of Human Kinetics and Recreation at Memorial University.

"It is vital for Newfoundland and Labrador to recruit, foster and retain top student researchers," said Glenn Janes, chief executive officer of RDC. "These students have a vested interest in research related to Newfoundland and Labrador's growing ocean industries sector and their research will contribute to solving technical challenges and unlocking development opportunities. RDC is proud to support these students and I wish them continued success in their studies."

"World-class research is at the heart of Memorial University and I'm delighted that 22 of our students have received RDC's Ocean Industries Student Research Awards," said Dr. Christopher Loomis, vice-president (research), Memorial University. "Graduate students are an essential part of Memorial's research success. The competitive funding provided by this scholarship program will enable them to conduct research that is important to Memorial University and critical to the future prosperity of the province."

"This is great news for Memorial," said then Minister of Education, the Honourable Darin King. "Our post-secondary institutions are the incubators of change. The creativity, skills and research capacity developed through our province's higher education system are essential for achieving success. A strong and vibrant research environment helps with the recruitment and retention of bright minds, attracts knowledge-based industries and fosters economic growth."

Engineering graduate student Brian Claus is one of the recipients of RDC's Ocean Industries Student Research Awards. Mr. Claus is originally from Prince George, B.C., but he decided to complete his doctoral studies in Newfoundland and Labrador thanks in part to the funding from RDC.



Brian Claus

"This award will allow me to design autonomous underwater vehicles to record oceanographic data year-round off the coast of Newfoundland and Labrador," said the doctoral candidate in ocean and naval architecture engineering in the Faculty of Engineering and Applied Science. "Understanding the Labrador Current, which flows down the coast and mingles with the Gulf Stream over the Grand Banks, is important in order to properly manage ocean-based resources."

Selection of award recipients was based on academic achievement, the technical merits of the proposed research plan and the relevance of the research to Newfoundland and Labrador's ocean industries. Final selection of award recipients was made with advice from RDC's research awards committee, comprised of academia, industry and government stakeholders.

The awards target post-secondary students enrolled in science, engineering and technology programs who have an interest in pursuing research in the province's growing ocean industries sector. They are open to post-secondary students in Newfoundland and Labrador, across Canada and internationally, who are interested in pursuing their studies and conducting leading edge research in Newfoundland and Labrador.

Engineering students who received RDC's Ocean Industries Student Research Awards are:

Brian Claus for "High Efficiency Long Range Autonomous Underwater Vehicle Navigation"

Rajib Dey for "Submarine Landslides and the Effects on Offshore Pipelines"

Brendan Harvey for "Absorbed Natural Gas Containment System for Marine Transportation Using a Porous Silicon Medium"

Peter Ma for "Riser Vortex-Induced-Vibration Time Domain Simulation Tool"

Evan Martin for "Stationary Propeller Wake Wash: Modeling and Applications for Ice Management"

Kenton Pike for "Ice/Keel/Seabed/Pipeline Interaction Events"

Jing Ping for "Innovative UV-Enhanced Produced Water Treatment System for Offshore NL"

Christopher Rossiter for "Advanced Numerical Modeling of the Effects of Goughing Ice Features on Buried Pipelines"

Justin Skinner for "Near Wellbore Modelling for Advanced Well Completion and Complex Well Trajectories"

Engineering students are leading the way

Professor Andy Fisher and Dr. John Quaicoe with students who attended this year's LIFE forum.

They were still getting settled at Memorial – finding their classes, meeting their professors and getting used to new schedules – but this past Sept., first-year engineering students were already thinking about becoming future leaders in their field. On Saturday, Sept. 18, 2010, engineering students and invited guests gathered at The Battery Hotel and Conference Centre in St. John's for the second annual Angus Bruneau Student Leadership and Innovation Fund in Engineering (LIFE) Forum.

The forum is sponsored by the Angus Bruneau Student Leadership and Innovation Fund in Engineering (LIFE) Program, which is a one-million-dollar donation by Drs. Angus and Jean Bruneau, to encourage and support student leadership and innovation in engineering education, research and community service. In addition to financial awards, the Angus Bruneau Student LIFE Program sponsors an annual leadership and innovation forum.

The day of inspiration and leadership began as Dr. Jean Bruneau welcomed students. Dr. Bruneau spoke on behalf of both her and her husband, Dr. Angus Bruneau. She told the students that this was a good leadership opportunity for them and expressed sincere appreciation to all of the students for coming out so early on a Saturday morning and to the Student Society "A" for organizing the second annual forum.

Following Dr. Bruneau's welcome address, Tom Brophy, director of Student Success Programs with Memorial's Student Affairs and Services, got everyone up and interacting with each other with some fun activities. In the afternoon, engineering alumnus Mr. Earl Ludlow spoke to the students about the challenges and successes he has experienced in his position as CEO of Newfoundland Power; Engineers Without Borders (EWB) president Mr. Evan Walsh spoke on international development and how students can get involved with their local EWB Chapter

and Mr. Nick Hounsell, executive director of Organizational Strategy, SIFE Memorial, talked about community involvement and how students can get involved with SIFE Memorial. There was also a session on sustainability from Memorial engineering professor Dr. Steve Bruneau.

The Angus Bruneau Student LIFE Program provides funding for student-led initiatives that significantly enhance the experience of students in the Faculty of Engineering and Applied Science at Memorial University, and supports initiatives that would not normally be funded through the faculty's operating budget. The fund provides financial awards on a matching basis such that students are required to raise some portion of the funds needed for the project.

Dr. Jean Bruneau

Engineering students geared up for another baja race

For the second consecutive year, Memorial's engineering students have competed at the annual Baja Society of Automotive Engineers (SAE) international competition in Peoria, Illinois. Last year's success in Rochester, NY was a huge motivator and the team was extremely excited about what could happen this year in Illinois.

"With the success of our team placing 25th overall, coming first in the water event and receiving the "rookie of the year" award in the 2010 competition, the team members were itching to exceed that standing," explained the team's captain, Rocky Strong. "The team set a goal when we first started, and that was to be in the top 10 in two years. By building off of the design from last year we designed a car that is much lighter and smaller for this year. By recognizing weaknesses in the design and tuning last year we focused on strengthening those areas this time around."

Baja SAE consists of three regional competitions that simulate real-world engineering design projects and their related challenges. Engineering students are tasked to design and build an off-road vehicle that will survive the severe punishment of rough terrain and sometimes even water. Last year, the team's best event was water maneuverability but, unfortunately, the water event wasn't part of the 2011 competition.

"The fact that there wasn't a water event this year definitely made the competition tougher for us; however, with a team of 15 talented and committed members we were confident going in that we would put up a tough fight for a top 10 position," added Mr. Strong.

And they did put up a tough fight but due to two flat tires and a sheared bolt, in the end the team placed 22nd overall out of a registered 115 teams.

But the annual Baja SAE competition isn't the only reason for Memorial Baja. A long-term goal is for Memorial to have a baja team long after the founders have gone on to pursue their engineering careers. By continuing to build upon the previous year's design, future engineering students will learn how to work as a team to apply their knowledge to achieve something great.

"With the junior members who are on the team there is no doubt that it will carry on, not only at the current level but constantly improving in performance," said Mr. Strong.

Engineering students return to national toboggan races

From l-r: Justin Mayo, Ryan Roberts, Ben Gerrior, Matt Hardy, Ryan Jacobs, Max Day, Vince Payne, Allan Linegar, Carmichael Polonio, Vanessa Walsh, Robyn O'Donnell and Leah Hodder.

For the second year in a row students from Memorial University of Newfoundland's Faculty of Engineering and Applied Science travelled to Hamilton, Ontario to compete in the Great Northern Concrete Toboggan Race (GNCTR) in hopes of winning the national title.

Memorial's entry was competitive with one of the lightest toboggans, one of the most in-depth technical reports and one of the highest safety ratings. However, due to track conditions and technical difficulties with its steering system, the team, unfortunately, did not complete a successful run.

"During each run the soft snow would gather under the rear running surface and cause the toboggan to shift to the right, normally this would be simple to overcome, but due to the design of the steering system the driver was unable to recover. As a result the toboggan continued to turn right until it had spun 180 degrees," explained team member Leah Hodder.

Since 1975, GNCTR has become the oldest and largest engineering competition in Canada, challenging over 400 engineering students from across the country to design, build, and safely race toboggans with a running surface made entirely of concrete. For more information on the GNCTR, visit www.gnctr2010.com.

The Faculty of Engineering and Applied Science participates in the Mining in Society Show

Dr. Lesley James chats with students.

Between Oct. 31 and Nov. 2, 2010, the Faculty of Engineering and Applied Science was an exhibitor at Mining Week's Mining in Society Show at the Johnson Geo Centre. The event is aimed at educating the public about the importance of the mining industry in their everyday lives and to learn about present and future mining professions and opportunities.

Five pavilions showcased the main areas of mining: exploration; mining/processing; sustainability; products/fabrication and education, and highlighted the many careers that are available directly, and indirectly, in the mining industry. In addition to the general public, more than 800 students from Grades 3 to 12 within the Eastern School District also attended, some coming from as far away as Clarenville to learn about mining.

The faculty's booth highlighted its process engineering program and educated visitors on topics such as mineral processing, oil and gas processing and environment and sustainability. Dr. Lesley James was on hand to demonstrate the elements of permeability and viscosity, which was a huge hit. Visitors to the booth also got to see various core samples, oil sand samples and the process of mineral processing.

Volunteer graduate and undergraduate students were also at the booth to promote process engineering and to explain the various displays.

Overall, the Mining in Society Show was the perfect tool for people of all ages to discover the importance of mining and its impact on our daily lives and an invaluable venue for the Faculty of Engineering and Applied Science to showcase its process engineering program.

Engineering students continue to give back to the community with the annual Winter Charity Ball

Members of Engineering Student Society "B" with Dr. Quaicoe, dean *pro tempore*.

On Friday, Feb. 5, the fifth annual Winter Charity Ball took place at the Johnson GEO CENTRE. The charitable event was organized by the Engineering Student Society "B" and more than $10,000 was raised in aid of the Coalition Against Sexual Exploitation of Youth (CASEY).

Holly Dunn, president of the Engineering Student Society "B", says the event was a huge success.

"It was nice to see the event unfold as such a success and it feels good for the engineering students to be able to give back to the community. It was exciting to see so many students, organizations and companies unite to fight for the prevention of sexual abuse of children. On behalf of the Engineering Society "B" and CASEY, I would like to thank everyone for their support."

CASEY is a coalition of community groups, government services, and interested individuals that are working together to help address the issue of youth sexual exploitation.

The night consists of a three-course meal, live music and a silent auction and an opportunity for engineering students to network with engineering professionals from the local community.

Sponsors included the Faculty of Engineering and Applied Science, Production Services Network, Professional Engineers and Geoscientists Newfoundland and Labrador, Newfoundland Transshipment, Technip, GJ Cahill & Company Ltd., Pennecon, Stewart McKelvey, Kavanagh and Associates, Fednav Limited and RDM Industrial.

Memorial continues strong presence at international ROV competition

2011 Eastern Edge Robotics Team

The Eastern Edge Robots Team has been proudly representing the province of Newfoundland and Labrador at international remotely operated vehicle (ROV) events since 2003. In June of last year, Memorial's Eastern Edge Robotics Team earned third place in the Explorer Division (advanced level) at the 2010 Marine Advanced Technology Education (MATE) International ROV Competition in Hawaii.

The team, which consisted of 19 students primarily from Memorial University's Faculty of Engineering and Applied Science (seven students) and the Marine Institute (six students), operated out of St. John's and consisted of university and college students located on the Avalon Peninsula. The team was guided by Dwight Howse, head of the Marine Institute's School of Ocean Technology.

"Eastern Edge Robotics is a launching pad for students to get hands-on skills that can be further used down the road in a possible career in the ROV field. The team has traditionally fared very well internationally, bringing home three first place, two second place and two third place finishes over the past eight years competing against teams from prestigious universities and colleges from around the world," said Mr. Howse.

The competition has been running annually for the past nine years and increases the students' understanding of the role ROVs play in engineering, science and underwater exploration. The competition increases awareness and visibility of marine technical fields, educational and career opportunities and potential employers. It also helps students develop skills, such as how to work effectively as a team; problem solving; critical thinking; troubleshooting; effective communications and project management, necessary to enter careers in technical fields.

The Faculty of Engineering and Applied Science is a strong supporter of this event and annually pays for the travel costs for engineering students. The team will compete again this year at NASA's Neutral Buoyancy Lab in Houston, Texas.

Process engineering at Memorial holds new lecture series

Engin Ozberk

On May 3, 2010, undergraduate and graduate students, professionals and concerned members of the public came together for the first annual Canadian Institute of Mining, Metallurgy and Petroleum: Distinguished Lecturers Series. They came to hear Engin Ozberk, vice-president of Innovation and Technology Development, talk about the present state of technology in the Canadian uranium industry – a topic of particular importance given our province's large uranium reserves in Labrador.

Mr. Ozberk spoke about how Canada is one of the largest uranium-producing countries in the world and Canadian companies are recognized as leaders in many aspects of the international uranium industry, including mining, extraction and refining of uranium, uranium fuel manufacturing, and design, construction and operation of nuclear power plants.

He went on to talk about how in light of its historical background, the status of current uranium mining and processing activities in Canada is reviewed, emphasizing advantages Canadian companies enjoy and challenges they face. He discussed the role of innovation in key aspects of uranium mining and processing activities - a source for clean energy - and proposed an approach for ensuring sustainability of the mining operations.

The lecture series is in conjunction with Memorial's first metallurgy society, which is affiliated with Memorial's new process engineering major in the Faculty of Engineering and Applied Science and was also created to reflect the importance of the mining industry in the province.

Dr. Shafiq Alam is the faculty advisor for the Student Chapter and an executive committee member of the hydrometallurgy section of CIM and is thrilled with the creation of the new student society and the lecture series.

"The MetSoc-CIM Student Chapter is a new entity at Memorial and is a great opportunity for our process engineering students to be involved with their professional societies," he said.

Engineering students compete in international sailboat competition

This past June, engineering students, as well as a marine engineer and some students from the Marine Institute, travelled to Annapolis, Maryland to compete in the 5th Annual International Robotic Sailing Competition. The first-time entry from Memorial learned lots from the experience and hopes to build upon this year's experience for future competitions. Team captain, Nathan Smith, is extremely pleased with how the team did and with what they accomplished.

"This was our first time attending this competition with our prototype vehicle, which was completely built by the team, and our goal was to complete the majority of the missions and bring back new ideas for the next boat – which we did. A few members of the team are accomplished sailors and they taught the rest of us about sailing rules, techniques and practical issues.

The team competed with a fully autonomous 2m Sailbot class sailboat which they designed, fabricated and programmed. To prepare for the competition the team tested various materials, actuators, rigging methods, etc. "Everything from the weather station to the fittings was fabricated and programmed, which was all very time consuming but at the same time very rewarding," explained Mr. Smith.

The competition consisted of match racing, station keeping and long distance races.

Sponsors included OP-Fibreglass, Mad Rock Marine Solutions Inc. and the Faculty of Engineering and Applied Science through the Angus Bruneau Student LIFE Fund.

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