

Benchmarks

FALL 2010



Faculty of Engineering
and Applied Science



The Dean's message

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Faculty of Engineering
and Applied Science

Welcome to the fall 2010 issue of *Benchmarks*. The Faculty of Engineering and Applied Science at Memorial University has been growing steadily since the first engineering degrees were given out in 1974. It has evolved from a primarily undergraduate teaching school to a top-notch, highly-respected engineering school with a focus on undergraduate and graduate education, research and community engagement. But earning such a reputation doesn't come easily. In undergraduate education, the Faculty of Engineering and Applied Science has consistently received high endorsements from the Canadian Engineering Accreditation Board (CEAB). In 2005, the undergraduate programs received six-year accreditation, placing our programs among the very best in Canada. This fall, the faculty will be at work preparing for an accreditation review of the programs in February 2011. Furthermore, this past year has brought growth and successes with hard work and dedication in the area of research. Many of our faculty members have secured major funding over the past year to further their research, which you will read about in this issue. We have also had several new hires, which includes both faculty members and support staff to continue to build capacity in research relevant to our province.



Dr. John Quaicoe

And, of course, we continue to attract some of the finest and brightest students, who make this all worthwhile. As we embrace another academic year, it seemed appropriate to reflect on the successes of our students over the past year in this issue of *Benchmarks*. In the following pages, you will be introduced to Rhodes Scholar Gillian Langor, whose work in West Africa represents outreach and community engagement beyond the province. You will also meet Andrew Myrden who received the Governor-General's Silver Medal for academic excellence. And over the past year, several of our students have competed at national engineering competitions and done extremely well.

I hope that you enjoy this latest issue of *Benchmarks*. 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 our activities.

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



Lead on!

On Saturday, Sept. 26, 2009, over 60 engineering students came together to experience the first annual Student Leadership and Innovation Fund in Engineering (LIFE) Forum at the Delta Hotel in St. John's. Despite the early start to the day, the excitement and enthusiasm of the students was apparent. Mr. David Sharpe, president of Engineering Student Society B, was very pleased with the level of enthusiasm shown by the participants.

"I hope this event continues to inspire students by opening their eyes to their personal potential and encouraging them to maximize their abilities," he said.

The day began with words of welcome from Dr. Steve Bruneau on behalf of his parents, Drs. Angus and Jean Bruneau, founders of the Angus Bruneau LIFE program. A long-time supporter of the faculty, Dr. Angus Bruneau's relationship with Memorial University began in 1968 when he established the Faculty of Engineering and Applied Science and served as its first dean. Dr. Bruneau also led the development of the co-operative engineering program, an innovation offered at only one other Canadian university at the time. Despite not being able to attend the forum, Dr. Steve Bruneau told students that his parents wished them great success.

The morning took a physical turn as Tom Brophy, director of Student Success Programs, got students out of their seats and led a number of activities to encourage interaction with each other and faculty members through P.U.M.P, Atlantic Canada's largest group mixer activity. The

forum's keynote speaker, Earl Ludlow, president and CEO of Newfoundland Power Inc., inspired students by discussing the challenges and successes he has experienced in his professional career. Brendan Brothers, co-founder of local company Verafin, gave the company address and encouraged students to think big by talking about his company's journey from a concept being tossed around by friends to becoming the North American leader in fraud-detection software. Throughout the day, students took part in a number of break-out sessions that focused on the role of leadership and innovation in international development, entrepreneurship and sustainability.

The Angus Bruneau Student LIFE Program encourages and supports student leadership and innovation in engineering education, research and community service. The 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.



Forum registration.

Dr. John Quaicoe extended as dean (*pro tempore*) of Engineering and Applied Science



Dr. John Quaicoe

Memorial University's Faculty of Engineering and Applied Science has been under new leadership since Dean Ray Gosine left his position almost two years ago to become the university's associate vice-president (research). Dr. Ramachandran Venkatesan became the acting dean, followed by Dr. John Quaicoe. In Oct. 2008, Dr. Quaicoe was appointed as dean (*pro tempore*), and a

recent approval by the university's Board of Regents will extend Dr. Quaicoe as dean (*pro tempore*) until June 2011.

The leadership and enthusiasm that Dr. Quaicoe has shown as dean of engineering has been invaluable to the growth of the faculty over the past year and a half but he says he couldn't do it without the strong support of dependable support staff and fellow faculty members.

"There have been many exciting initiatives and accomplishments in the Faculty of Engineering and Applied Science and I'm

sure this will continue. As a result, my job as dean (*pro tempore*) is an exciting and challenging one but made easier with reliable and dependable support staff and fellow faculty members who are hard working and as excited about growth and enhancing the reputation of the Faculty of Engineering and Applied Science as I am," he said.

Dr. Quaicoe joined the Faculty of Engineering and Applied Science at Memorial in 1982 as an assistant professor and since that time has been a huge contributor to the faculty and its overall growth. From 1990 to 1999, he was chair of the electrical engineering discipline and from 2002 to 2008 he was associate dean of undergraduate studies.

Working with Dr. Quaicoe to improve and grow the faculty are the following:



Prof. Andy Fisher
Associate Dean
Undergraduate Studies



Dr. Leonard Lye
Associate Dean
Graduate Studies



Dr. Brian Veitch
Associate Dean
Research

New research centre at Memorial University promotes innovation in wireless communications

Wireless networks have become such a huge and important part of our world that a new research centre at Memorial is researching new and more secure ways to better meet our communications needs.

We've established a new Wireless Communications and Mobile Computing Research Centre (WCMCRC) in Memorial's Faculty of Engineering and Applied Science to conduct research that will lead to a richer experience for the mobile computer user," explained Dr. Ramachandran Venkatesan, who is the centre's director.

Launched in April 2009, with an objective to consolidate and expand the research activities taking place at various parts of the university, the research centre will provide a critical means of focusing the necessary applied research and development in order to foster economic growth in a burgeoning regional industry.

"The research centre is expected to enhance the global competitiveness of Atlantic Canadian companies and governmental and non-governmental organizations by facilitating the development of leading edge wireless technologies. Furthermore, the WCMCRC complements other research activities at Memorial and acts as a catalyst for research in related areas in digital communications, computer engineering and mobile commerce," added Dr. Venkatesan.

The activities of the centre are well-integrated into the current research directions of the electrical and computer engineering groups at Memorial, and also includes professors and graduate students from other areas at Memorial, such as the Department of Computer Science and the Faculty of Business Administration. It will involve the establishment of a network of wireless researchers and a physical laboratory space in which the research will be undertaken and will provide a critical means of focusing the necessary applied research and development in order to foster economic growth in a burgeoning regional industry.

Some research areas include cognitive and intelligent radio; network infrastructure and advanced resource management methods; co-operative wireless communications and MIMO; acoustic communication for tetherless underwater networks; mobile, ad-hoc wireless and sensor networks; future wireless communications standards; location aware computing; secure communication for mobile devices and implementation of security algorithms; wireless communications for environment monitoring and safety applications; and hardware implementation, prototyping and testbed development.



Drs. Octavia Dobre and Mohamed Ahmed chat with grad student Talha Rasheed in the wireless centre.

Engineering lectures continue to generate important discussions

The Faculty of Engineering and Applied Science at Memorial continues to partner with the Professional Engineers and Geoscientists of Newfoundland and Labrador (PEGNL) to bring important engineering-related discussions to the people of our province through the Speaking of Engineering Lecture Series.

This past December, Dr. Shawn Kenny, who is the Wood Group Chair in Arctic and Cold Region Engineering and an associate professor in Memorial's Faculty of Engineering and Applied Science, examined key issues for the exploration and development of hydrocarbon resources in Arctic environments.

The development of Arctic hydrocarbon resources, which may account for 20 per cent of the world's undiscovered resource potential, presents a viable opportunity to meet global energy demands and requirements for manufactured products. The exploration and development of oil and gas reservoirs in these environments present technical and logistical engineering challenges for surface infrastructure and subsea facilities. Dr. Kenny presented a discussion on historical and current activities with a look towards potential future needs and issues.

Then in January, Marcel Coutu, CEO of Canadian Oil Sands and the Chair of the Board of Syncrude, Canada's largest oil sands mining operation, spoke about the impact of Canada's oil sands on the people of Newfoundland and Labrador.

More than sharing what he thinks, Mr. Coutu wanted to hear about the questions and concerns that people in Newfoundland and Labrador have about Canada's oil sands. He provided an update on recent developments in the oil sands, the economic impact to both Canada and Newfoundland and Labrador, and the continual improvements the industry is making on their environmental performance. The evening ended with a frank and honest dialogue on the economic, social and environmental implications of Canada's oil sands.

Two months later, Richard Crowdis, vice president and project director with Black & Veatch, a leading global engineering, consulting and construction company, spoke to a local audience about the approaches to long distance electric power transmission and delivery systems through remote terrains and subsea crossings.

Mr. Crowdis outlined traditional approaches, as well as a summary, of the technologies in the high-voltage alternating current (HvAC) and high-voltage direct current (HvDC) transmission line systems. He also discussed power transmission and redundancy through subsea crossings,



Dr. Shawn Kenny



Richard Crowdis

including HvDC transmission lines inside of large and long conduits or tunnels.

The latest lecture featured Major James Fera, a military engineer who came to St. John's to talk about his recent deployment to Afghanistan where he and 16 members of his squadron were assigned to the Kandahar Provincial Reconstruction Team (KPRT).

Major Fera spoke about the military's role in reconstructing and developing Kandahar and enabling communities to stabilize Afghanistan. He provided his audience with a unique opportunity to gain first-hand insight about the Canadian Forces engineers' contribution to the Afghanistan mission. He shared how, as members of the KPRT, their role was to assist and mentor the Afghans in their reconstruction efforts. His audience learned about the engineering challenges of working in this conflict-stricken region as well as his team's reconstruction projects during their six-month tour.

Speaking of Engineering public 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.



Major James Fera



Marcel Coutu

The Cahill Group of Companies funds help centre for first-year engineering students

Funding

With a commitment of \$150,000 over three years, The Cahill Group of Companies has established a help centre for first-year engineering students located in Memorial's Faculty of Engineering and Applied Science.

The Cahill Engineering One Help Centre provides activities directly related to academic course work in first-year engineering courses. It focuses on providing additional instruction and tutorials on course material for students who are doing first-year engineering courses in Engineering One.

Funding supports the centre through provision of space, computers and software. The centre provides assistance to students in course work required for successful completion of Engineering One. A weekly tutorial provides additional material of relevance to Engineering One students, co-ordinated through the Cahill Engineering One Help Centre.

Cahill Lecture Series



John Henley of The Cahill Group of Companies and Gordon Phillips of Husky Energy talk to engineering students at the first annual Cahill lecture.

As part of the partnership with The Cahill Group of Companies, the Faculty of Engineering and Applied Science co-ordinates an annual Cahill lecture offered in the fall semester to Engineering One students. The lectures feature leading professional expert speakers from The Cahill Group of Companies presenting on current projects relevant to Engineering One course material.

The first annual lecture took place on Wednesday, March 10, 2010 and approximately 200 students gathered in the Angus Bruneau Engineering Lecture Theatre to hear guest speakers John Henley of The Cahill Group of Companies and Gordon Phillips of Husky Energy talk about subsea fabrication and tie-in. In early 2008, The Cahill Group of Companies was awarded the fabrication of the subsea manifolds for the North Amethyst offshore oil development, operated by Husky Energy. North Amethyst will be tied in to the existing White Rose oil field project. The two senior project representatives provided engineering students with an overview of what it takes to execute a project of this magnitude.

The lecture series is a wonderful networking opportunity for engineering students and industry people and offers engineering students an opportunity to attend presentations

on current projects relevant to engineering course material from leading professional experts.

Dr. John Quicoe is the dean (*pro tempore*) for Memorial's Faculty of Engineering and Applied Science and was excited to see such a large gathering for the first Cahill lecture.

"Many of Memorial's engineering students complete work terms with The Cahill Group of Companies and Husky Energy, and this lecture series is another way that industry continues to build relationships with Memorial University, especially with the Faculty of Engineering and Applied Science," he said.

The next Cahill lecture is scheduled for fall 2010.

Faculty continues Dean's Table Breakfast Series

In its third year, and four breakfasts later, the Dean's Table Breakfast Speaker Series is a huge success.

Two of the series' most recent guest speakers include Hareesh Pillai, senior project manager, Hebron, ExxonMobil Development Company; and Glenn Addison, project manager, Hibernia Southern Extension, ExxonMobil.

On May 12, 2009, Mr. Pillai provided an overview to key local industry people on the Hebron project and long term plans. Then, on May 13, 2010 Mr. Addison spoke to invited guests about the Hibernia Southern Extension projects and how they represent the first subsea development for the Hibernia platform and how they will help extend the life of the Hibernia development.



Hareesh Pillai



Glenn Addison

The breakfast series is an outreach initiative of the Faculty's Alumni Relations Committee – a sub-committee of the Engineering and Applied Science Advisory Council – whose mandate is to build relationships with alumni and friends of the university through professional development and networking opportunities.



Guests gather for a Dean's Table breakfast.

Engineering Management Takes Off



From l-r: Amanda Frost, Kelly Devereaux, Dr. Amy Hsiao, Michael O'Brien, Leslie O'Brien and Xian Liang Zheng.

Imagine a weekly round-table discussion of current issues faced by managers in engineering or technology-based industries. The graduate students in Dr. Amy Hsiao's ENGI 9396 Engineering Management Topics course have made this weekly discussion a reality. Coming from the various disciplines of engineering, including mechanical engineering, electrical engineering, and ocean and naval architectural engineering, the class encompasses a complementary blend of students from the Master of Business Administration and Master of Engineering Management programs, full-time and part-time, local and international students, and a "radical" ratio of women to men engineers of 2:1.

"The lectures and round-table discussions have brought out many examples of real knowledge and experience and provided a channel for managerial thinking to be put to future engineering practice. The MEM and MBA students all have undergraduate engineering degrees, so they share a common bond of Engineering...and now Management," explained Dr. Hsiao.

This past winter was the first offering of the course, which includes topics such as managing innovation, technology strategy, knowledge management, new product development, leadership, ethics, globalization, and corporate entrepreneurship. Through lectures, case studies, invited speakers, and student-led discussions, the course explores the relevant challenges of engineering managers in new and established firms in technology-based sectors.

The Master of Engineering Management program offers students with undergraduate engineering degrees to gain advanced knowledge in their field of engineering and formal training in business. This course-based master's program is a flourishing collaboration between the Faculty of Engineering and Applied Science and the Faculty of Business Administration and draws on graduate courses in both faculties. The program can be completed on a full- or part-time basis with the flexibility of online courses offered through Distance Education and Learning Technologies.

"Memorial is one of a few North American universities to offer a master's degree in engineering management, which, since we talk about innovation all the time, is in itself quite innovative. Engineers are asking for relevant management training, and this program seeks to respond to this need," said Dr. Hsiao.

Engineering professor, and ship's structures expert, is a Dive Detective!



Dr. Claude Daley

On Wednesday, March 31, 2010, Professor Claude Daley of the Faculty of Engineering and Applied Science was featured on the History Channel's "Dive Detectives" show.

In this new show being produced by Yap Films, the father-and-son diving team of Mike and Warren Fletcher focus on the wreck of the *Edmund Fitzgerald* and what really caused the Great Lakes freighter to sink during a November storm.

The wreck *Edmund Fitzgerald*, made famous in the iconic Canadian ballad of Gordon Lightfoot, occurred in November 1975 while the *Fitzgerald* was trying to stay ahead of a massive storm system that blew off the prairies and produced mountainous waves on Lake Superior. All hands were lost, without even a mayday signal. Dr. Daley is a world leading expert on ships structures. He has many thoughts and questions about the freighter and why it sank.

"The underwater video of the wreck is impressive. The vessel lies in two pieces on the floor of the lake, in about 500 feet of water. There are many signs of the violence that must have accompanied the last moments, but there is no single clue that makes it all clear. Was it a rogue wave, a hatch cover problem, an earlier touch in shallow waters, a hull that wasn't strong enough for the storm, or just very bad luck?"

The show also featured the Marine Institute's Centre for Marine Simulation. The Centre's ship bridge simulator was used to recreate the vessel and simulate her last fateful voyage.

New process engineering research lab at Memorial



From l-r: Dr. Faisal Khan, Glenn Janes of RDC, Mark MacLeod of Chevron and Dr. Christopher Loomis.

A partnership between Chevron Canada, Memorial University of Newfoundland and the Research & Development Corporation (RDC) means a new process engineering research laboratory on Memorial's St. John's campus.

The new Process Engineering Design and Research Laboratory (PEDRL) will provide a unique space to researchers, which will include undergraduate and graduate students, co-op students and research engineers, to work as a team to study the challenges faced by industry and to develop technical solutions. The laboratory will provide a unique facility in the university to catalyze process engineering design research, to develop a culture of team work in applied research related to process design, and to respond to the challenges faced by the process industries.

PEDRL will house a facility for process modelling, process design, group meetings, and a pilot plant development. It will be equipped with required hardware and software to undertake the research and development projects.

"This new Process Engineering Design and Research Laboratory will help students prepare for work in the energy sector and connect the work of senior researchers at Memorial with our industry partners. It is a welcome development which will pay dividends to the university, our faculty and most importantly, our students," said Dr. Christopher Loomis, then President and Vice-Chancellor, pro tempore, of Memorial.

The research team members for the lab will be the faculty's process engineering team, which include Drs. Faisal Khan, Kelly Hawboldt, John Shirkoff, Shafiq Alam, Syed Imtiaz, Lesley James and Yan Zhang. These members will supervise design and research projects of co-op students and process engineering design teams completing Terms 7 and 8 design projects.

TD donates \$400,000 to support graduate students



PhD candidate Jing Ping discusses her environmental research with then President Dr. Christopher Loomis and provincial Minister of Education Darin King.

Graduate students pursuing environment-related studies will be eligible for new bursaries thanks to a donation from TD Bank Financial Group.

The \$400,000 endowed donation, which was presented this past February on Memorial's St. John's campus, will enable the university to advance its teaching and research strengths in multiple environment-related disciplines.

TD's support enables Memorial to address an urgent need to build its number and level of graduate awards. In 2008-2009, only 79 graduate students – three per cent of the graduate student population – received donated financial support.

"A key pillar of Memorial's Strategic Plan is to grow our capacity, impact and reputation in research. Increasing the number of graduate students, especially those in PhD programs, is critical to achieving that goal," said Dr. Loomis.

Dr. Noreen Golfman, dean of the School of Graduate Studies (SGS), said the donation will go a long way in supporting graduate-level environmental research at Memorial.

"This funding will not only enable scholars to advance cutting-edge research projects, but will also make it possible for deserving students to focus more on their academic pursuits without the burden of financial obstacles," she said.

TD's Bruce Shirreff said that strengthening Memorial's ability to provide such opportunities to students will have a lasting impact on our environment for years to come.

"The environment and Canada are forever linked and we recognize the growing need to provide students with access to funding so we can advance our country's expertise in this important field," he said.

"These bursaries support the provincial government's innovation strategy which is focused on stimulating innovation in the province and providing the necessary resources for

academic and research institutions,” said Minister King. “This is good news for the students and good news for the future of Newfoundland and Labrador.”

Dr. Loomis echoed this sentiment.

“Through this generous gift, Memorial will be able to offer more competitive financial packages to attract the best students wishing to pursue advanced studies and research on the environment. That is important not only to the future of Memorial, but to the sustainability of the planet we all share.”

Faculty of Engineering professor wins Petro-Canada Young Innovator Award



Dr. Ralf Bachmayer

Dr. Ralf Bachmayer, an associate professor in the Faculty of Engineering and Applied Science, is a 2009 recipient of the Petro-Canada Young Innovator Award.

Dr. Bachmayer’s research on underwater gliders earned him the award. In recent years, there has been a dramatic increase in the use of autonomous underwater gliders in applications in both the coastal and the deep ocean. The unique capabilities of autonomous underwater gliders, including their ability to stay at sea unattended for weeks and months, allow processes and events in the deep ocean to be observed and studied in detail.

“Gliders move through the water column in a saw-tooth pattern using fixed wings. They have the ability to change weight from heavier to lighter than the surrounding water. This saw-tooth pattern works well for profiling the vertical ocean water structure. However, for other tasks that require controlled horizontal flight, such as continuous measurement of ice-thickness, the gliders’ capabilities are severely limited at present,” explained Dr. Bachmayer.

Dr. Bachmayer’s research will develop an active propulsion module for a hybrid underwater glider that can be added to existing gliders. The propulsion module will not serve as the main propulsor, but will only be used intermittently to enable level flight or to overcome areas of high currents that would otherwise present an insurmountable obstacle to the slow-moving gliders. Once the device is turned off it should not increase the overall drag of the system and therefore reduce the range of the glider.

“Besides other advantages the addition of horizontal flight will enable the glider not only to map ice from below but also search for a lead in partially ice-covered regions. Since gliders rely on access to the free surface for communication and navigation, the ability to detect and surface in an ice opening is crucial for this kind of operations,” added Dr. Bachmayer.

The Petro-Canada Young Innovator Awards Program was created to recognize and help support the work of outstanding young faculty researchers at Canadian universities, colleges and major research institutes, particularly those whose research has the potential to be of significance to society at large.

The Faculty of Engineering and Applied Science reaches out to high school students

Through financial support from the provincial government, the Faculty of Engineering and Applied Science will introduce high school students to core engineering principles through Interactive and Educational Engineering Kits (IEEKs) that will complement their current science and technology curriculum.

The kits will focus on hands-on learning, with components to engage approximately 30 students. Prior to using the kits, students will receive a brief introduction of the topic or principle each kit demonstrates. For example, during the introduction of the kit on Light Emitting Diode (LED) Transmitter, students will learn what a capacitor is, how a variable resistor works and how an anode differs from a cathode. Following assembly, there will be a discussion of why the kit worked, or didn’t work, and how it relates to everyday life.

The kits will be launched through an Open House providing both students and the general public with the opportunity to view and interact with the IEEKs, as well as the equipment in the faculty’s laboratories, facilities and research centres. In addition, members from the Faculty of Engineering will be visiting participating high schools in the Eastern School District during the 2010-2011 academic year, and if the project is successful the kits will become available to all schools across the province.

Professor Andy Fisher is the associate dean of undergraduate studies at Memorial’s Faculty of Engineering and Applied Science, and is thrilled with the support from the provincial government and even more excited about having another option to get high school students thinking about a career in engineering.

“The increased exposure to engineering and technology and hands-on learning that these students will receive can lead to increased enrolment in higher level science and math courses as well as an increase in the number graduating students going on to pursue post-secondary education in engineering,” said Professor Fisher.

Engineering alumnus on Canada's Top 40 Under 40



Engineering alumnus Jamie King, who graduated with a computer engineering degree in 1999 is a 2009 recipient of Canada's Top 40 Under 40 – a well-deserved honour for the president and chief executive officer of Verafin Inc., a leading software company based in St. John's, Newfoundland.

Jamie King

Mr. King has experienced great success since launching Verafin, and attributes his company's success to hard work and determination.

"In addition, I have surrounded myself with talented people who have worked hard to make Verafin what it is today," he added.

He also acknowledges his engineering education at Memorial.

"The engineering program provided me with the foundational skills and knowledge that allowed us to build a leading edge solution for fraud detection and anti-money laundering."

Based in St. John's, Verafin specializes in fraud and money-laundering detection technology and is one of North America's leading BSA/AML Compliance and Fraud Detection software providers.

When asked what this recent honour means to him, Mr. King quickly adds, "It has validated that we are building a great company at Verafin. We will continue to build Verafin into an international leader in the fraud-detection and security software space."

Canada's Top 40 Under 40, established in 1995, is a national program that uniquely celebrates the achievements of 40 Canadians in the private, public and non-profit sectors, who have reached a significant level of success before the age of 40.

The program is designed to promote mentorship and professional development by introducing these leaders to the established business community and by promoting them as role models for young Canadians. By building awareness and support across Canada for these outstanding individuals, this program serves as an example of national unity.

Verafin co-founders receive the Gardiner Centre's Entrepreneur of the Year Award



From l-r: Janet Gardiner, Jamie King, Dr. Wilfred Zerbe, Raymond Pretty, Brendan Brothers and Susan Gardiner.

On Tuesday, April 27, 2009, co-founders of local company, Verafin, were honoured at Memorial's Faculty of Business Administration's 26th annual Partners Reception, an event which recognizes local business leaders.

Verafin co-founders, and computer engineering graduates with a specialization in artificial intelligence, Jamie King (B.Eng. '99), Brendan Brothers (B.Eng. '02) and Raymond Pretty (B.Eng. '01), received the Gardiner Centre's 2010 Newfoundland and Labrador Entrepreneur of the Year Award.

Their combined vision of creating a better solution for financial institutions is what motivates them to always work to discover new processes and new ideas. As president and CEO, Mr. King is leading the product development efforts and establishing the long term vision of the company while Mr. Brothers focuses on the customer-related aspects of the business, from customer support and training to sales and marketing. Meanwhile, Mr. Pretty is dedicated to incorporating advanced technologies into the Verafin application and has a passion for understanding how customers interact with the Verafin solution.

Verafin is a leading software company that specializes in fraud and money-laundering detection solutions. Incorporated in 2003, Verafin has grown to become a leading provider of anti-money laundering and fraud solutions with more than 500 customers in North America. The company currently employs 90 people in St. John's and was recognized in 2009 as one of the fastest growing companies in Atlantic Canada by Progress Magazine.

Engineering graduate Forhad Ahmad masters his education



From l-r: Dr. Christopher Loomis, Forhad Ahmad and Chancellor Rick Hillier.

Born and raised in Sylhet, a small town in Bangladesh, Forhad Ahmad has accomplished what he came here to do. On May 27, during spring convocation, he received his master's degree in mechanical engineering from Memorial University.

Although a very long way from home and his family and the life he knew, Mr. Ahmad has adjusted to St. John's and life at Memorial since beginning his master's degree in Sept. 2007. In fact, Mr. Ahmad not only received his master's degree at convocation but he also received the prestigious Chancellor's Graduate Award.

The Chancellor's Graduate Award is an annual award given to a student for his/her outstanding leadership contributions to graduate student life and other areas of the community during his/her time at Memorial. Mr. Ahmad also received The Fry Family Foundation Graduate Leadership Award, which is presented to the recipient who has been selected to receive The Chancellor's Graduate Award.

This past May, Mr. Ahmad also received the Fellow of the School of Graduate Studies from Memorial University in recognition of his outstanding achievement in the graduate program. And, he received the International Student Resource Centre's Academic Excellence Award as well as the Hira & Kamal Ahuja International Graduate Fellowship – both of which are given to an international student who displays academic excellence.

Mr. Ahmad was accepted into four Canadian universities to complete his graduate studies and chose Memorial because it enabled him to pursue his passion which is asset integrity management for oil and gas facilities.

"There is a good scope to learn and grow in this area and Newfoundland is one of the best places in the world to work in this area after completing a master's degree. Also, one of my friends was studying at Memorial University at the time and I got information from him and from the Internet (after searching a bit!!) that this is a nice place to study and live. It is

a safe and secure place, rich in history and natural beauty. People are friendly and welcoming here," he said.

With his master's degree finished, Mr. Ahmad now looks beyond student life and looks forward to staying in Newfoundland and a career focused on energy and energy-related industry.

Alumni Profile



Dr. Sathya Prasad

Dr. Sathya Prasad Mangalaramanan has come full circle to achieving success and fulfillment in life. After completing a bachelor's degree in mechanical engineering from College of Engineering Guindy, Anna University in his hometown of Chennai, India, he came to Canada, where he completed his master's at the University of Regina and his PhD at Memorial University. He received the Governor General of Canada's Academic Gold Medal and the David Dunsinger Award for his doctoral work. He was gainfully employed for the next eight years at Babcock & Wilcox Canada and Dana Corporation, USA. In all, he had spent more than 12 years in North America, before returning to Chennai to work. For Dr. Prasad, Memorial was the best choice for his PhD for a couple of reasons.

"My supervisor at the University of Regina was Dr. R. Seshadri. He was Dean of Engineering there at the time. At the same time I completed my master's program, Dr. Seshadri was posted to Memorial as Dean of Engineering and Applied Science. He encouraged me to do my PhD there and I did. My transition to MUN was a logical and natural extension of my masters program," he explained.

Dr. Prasad is now back living in Chennai with his wife and son and working as a general manager of advanced engineering at India's second largest commercial vehicle company, Ashok Leyland. And while happy to be home again, he has fond memories of his time at Memorial and will quickly point out that Memorial is unique in what it offers its students.

"There are so many things I loved about Memorial. The faculty was good. The library and facilities were outstanding. St. John's is safe and quiet with no pollution and the people are really friendly. Memorial is a perfect place for contemplative people to do some serious research and that is unique."

RESEARCH at its best

In the last issue of Benchmarks we told you about how busy our faculty members are with their research. A year later, not much has changed on that front. With more than \$13 million in external research funding over the past year, our professors are contributing to enhancing the capacity, impact and reputation in research at Memorial University.

The following research funding was secured over the past year:

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

Dr. Siu O'Young, along with co-investigators Drs. Krouglicof and Hubbard, received \$100,000 for "Autonomous collision avoidance system for small unmanned aerial vehicles."

Collaborative Research and Training Experience (CREATE)

Dr. Wei Qiu, along with colleagues from the Faculty of Engineering and Applied Science and the Faculty of Science at Memorial University of Newfoundland and from Dalhousie University, will receive \$3.24 million dollars over the next six years for the "NSERC Collaborative Research and Training Experience (CREATE) Program."

Industrial Research and Innovation Fund (IRIF) Grants:

Drs. Mohamed Ahmed and Octavia Dobre received \$222,819 for "Advanced Wireless Communication Research Lab (AWCRL)."

Prof. Dag Friis received \$135,000 for "An Operational Efficiency and Energy Audit in the Newfoundland and Labrador Fishery."

Mathematics of Information Technology and Complex Systems (MITACS):

Dr. Cheng Li, along with co-investigator Dr. Ramachandran Venkatesan, received \$5,000 for "Analysis, design and implementation of dispersion channel models on FPGA platform for optical communications networks."

Internship Acceptance:

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

Dr. Mahmoud Haddara received \$45,000 for "Wave forces modeling on offshore structures."

Drs. Mahmoud Haddara and Faisal Khan received \$7,500 for "Stochastic degradation modeling for risk-based integrity assessment."

Dr. Shawn Kenny received \$45,000 for "Constitutive Models and Forming Process Simulation Tools for High Strength Linepipe."

Drs. Wei Qiu and Heather Peng received \$45,000 for "Development of Computational Fluid Dynamics (CFD) code for marine application."

Accelerate NL:

Dr. Shawn Kenny, along with Dr. Ryan Phillips of C-CORE, received \$30,000 for "Yield Envelopes for Oblique Pipeline/Soil Interaction Events."

Drs. Shawn Kenny and Bipul Hawlader, along with Michael Paulin of IMVPA, received \$155,333 for "Probabilistic Framework to Assess Integrity of Offshore Infrastructure in Ice Environments."

Harris Centre:

Dr. Shafiq Alam received \$14,700 for "Treatment of severe acid mine drainage – a sustainable approach."

Dr. Amy Hsiao received \$6,000 for "Materials Science in Entrepreneurship, Design and Community."

Dr. Tariq Iqbal received \$15,000 for "Feasibility Study of Pumped Hydro Energy Storage for Ramea Wind-Diesel Hybrid Power System."

International Grant:

Dr. Faisal Khan received \$1.05 million US from the Qatar National Priorities Research Program (NPRP), in partnership with Qatar University, UBC and UIOT, for "Development of a risk-based design, evaluation and decision-making tool for a gas processing plant."

Atlantic Innovation Fund (AIF):

Dr. Dan Walker received \$2.1 million to integrate sonar and advanced feature-based navigation and adaptive mission control systems for the Explorer Autonomous Underwater Vehicle (AUV).

Dr. Eric Gill received \$1.7 million for "High Frequency Radar Ocean Surface Applications (HF-ROSA)."

Newfoundland and Labrador Hydro Grant:

Dr. Geoff Rideout received \$69,000 for "Improved damage detection and strength prediction for wooden transmission line poles."

AUTO21 Network of Centres of Excellence:

Dr. Geoff Rideout received \$18,500/year for the next two years for "Hybrid vehicle testbed for active safety systems and intelligent grid interfacing."

Terra Nova Project (operated by Suncor Energy):

Dr. Amy Hsiao received \$190,000 from the Terra Nova project (operated by Suncor Energy) and the Research & Development Corporation (RDC) of Newfoundland and Labrador's Industrial Research and Innovation Fund (IRIF) to conduct activities in applied research and development in asset integrity management over the next two years.

Dr. Hsiao's research project is part of a larger initiative which also includes \$90,000 to support an extension of research on fitness-for-service assessments, to be conducted by Dr. R. Seshadri.

Auto Pilot: New Autonomous Ocean Systems Laboratory launched



From l-r: Dr. Ray Gosine, then VP (Research); Glenn Janes of RDC and Dr. Ralf Bachmayer.

Ice-covered regions, such as the Arctic, will be vastly more accessible for research with the official opening of the new Autonomous Ocean Systems Laboratory (AOSL) at Memorial University.

"Memorial is extremely pleased to officially open this new Autonomous Ocean Systems Laboratory on its St. John's campus," said Dr. Christopher Loomis, then president and vice-chancellor (*pro tempore*). "This research facility will advance harsh environment research and is yet another indication of how important the research at Memorial is to industry partners. This laboratory will benefit the university, our faculty and students and people nationally and internationally."

The new lab will provide a uniquely designed/equipped space to researchers, including undergraduate and graduate students, co-op students and research engineers. This new environment will help catalyze research on autonomous oceans systems; foster a culture of team work in applied research related to harsh environments, such as the Arctic; and assist the university in reaching a better understanding of ice-covered regions, which have been in otherwise inaccessible environments, through the use of autonomous underwater vehicles (AUVs).

The AOSL has been established through generous financial support from the Research & Development Corporation of Newfoundland and Labrador (RDC), the Canada Research Chairs program and the Canada Foundation for Innovation (CFI).

"This new research facility will help generate knowledge, as well as technical expertise, focused on our ocean and harsh environment," said Glenn Janes, chief executive officer of the Research & Development Corporation. "Research using underwater vehicles represents a significant opportunity for Memorial University to build expertise for the benefit of Newfoundland and Labrador."

To initiate the partnership with Memorial, RDC is investing a total of \$540,755 through its Industrial Research and Innovation Fund (IRIF), the Canada Research Chairs program has committed \$500,000 and the Canada Foundation for Innovation through its Leaders Opportunity Fund has committed \$192,944. Their contributions have not only established the lab but will also help grow Arctic research in Newfoundland and Labrador.

"Providing researchers with the tools they need to undertake leading-edge research is what the CFI is all about," said Dr. Eliot Phillipson, president and CEO of the CFI. "The research advancements and knowledge sharing that this new lab will enable are sure to have a real and positive impact for all Canadians."

"The Autonomous Ocean Systems Laboratory is a demonstration of the partnership between Memorial and provincial and national funding agencies to establish a world-class facility for Arctic research," said Dr. John Quaicoe, dean (*pro tempore*), Faculty of Engineering and Applied Science at Memorial University.

"Our government is investing in science and technology to create jobs, strengthen the economy and improve Canadians' quality of life," said federal Minister of State for Science and Technology, Gary Goodyear. "I would like to wish Dr. Bachmayer and all the researchers involved in the Autonomous Ocean Systems Laboratory success in their work. Through your hard work and dedication you are helping to realize the full potential of our natural resources, while ensuring a cleaner, safer environment."



Dr. Bachmayer talks about the gliders at the official opening.

Engineering professors receive substantial funding for research



Two engineering professors, and their research, got a major boost from the federal government this past January as Ottawa announced almost \$10 million in funding under Round VII of the Atlantic Innovation Fund (AIF) announced by the Atlantic Canada Opportunities Agency (ACOA), for Memorial-led research and development during a news conference at the Marine Institute.

Dr. Dan Walker is the principal investigator on a project involving the university's autonomous underwater vehicle (AUV) that will receive \$2.1 million over a four-year period. The funding will help integrate sonar and advanced feature-based navigation and adaptive mission control systems for the university's Explorer AUV.

"This project will enable high-quality seabed surveys with real-time changes during the AUV mission to focus on areas of interest, thereby reducing time, energy, cost, and risk of vehicle loss," said Dr. Walker, an associate professor in the Faculty of Engineering and Applied Science.

"The advancements will enable the AUV to look at its environment, determine its position, and be able to autonomously decide which areas of the seabed to survey in greater detail," he added.

Dr. Eric Gill's project, which involves the use of high frequency radars to monitor ocean activity, was awarded \$1.7 million over a four-year period from AIF. Dr. Gill's research will develop new software for high-frequency radar signals that could be used in a variety of oceans-related research including identifying the path and speed of ships and icebergs, assisting search and rescue planning, and supporting meteorological applications such as weather forecasting.

"The funding will be critical in enabling the production and deployment of high-frequency radars for collecting oceanographic data over a very large area," said Dr. Gill, a professor in the Faculty of Engineering and Applied Science.

Major investment creates new chair position at Memorial



From l-r: Dr. Christopher Loomis, Dr. Shawn Kenny, Hon. Dave Denine, Sir Ian Wood and Glenn Janes.

Last November, thanks to a significant investment from both industry and government, Dr. Shawn Kenny was formally appointed as the Wood Group Chair in Arctic and Cold Region Engineering at Memorial University.

The chair, one of the largest research chair contributions at Memorial, is sponsored by international energy services company, John Wood Group PLC. The chair is associated with Memorial's Ocean Engineering Research Centre in the Faculty of Engineering and Applied Science and will benefit both undergraduate and post-graduate engineering students.

The Wood Group invested \$500,000 to sponsor the chair over a five-year period in collaboration with Memorial University. In addition, the Research & Development Corporation (RDC) of Newfoundland and Labrador will contribute \$500,000 in support of building research capacity in this priority area through the Industrial Research and Innovation Fund (IRIF).

With exploration in the Arctic still in its infancy, Wood Group's objective is to develop cutting-edge technology for use in Arctic and cold regions for the oil and gas industry. Through the chair position, research will be conducted on pipeline design, construction and operations for northern regions.

Dr. Kenny, an associate professor in Memorial's Faculty of Engineering and Applied Science, said the investment will be a catalyst for enhancing and developing diverse research opportunities at Memorial.

"The appointment also has strategic importance, from both the regional and international perspective, in terms of technology development that may lead to further growth of local industry, revenue generation and, most importantly, the training of highly qualified personnel who are critical to sustainability of the research program and industry."

"The investment demonstrates the relevance and strength of research activities at Memorial with respect to ocean technology in harsh and ice environments. This is a recognition of Memorial's legacy and future that is aligned with the provincial strategic vision."

With a background in academia, research and development, and the oil and gas industry, Dr. Kenny brings two decades of professional experience to his position. His specialty is in offshore pipelines in ice environments with a focus on strain-based design of pipeline systems.

Dr. Kenny has been involved with engineering studies for offshore pipeline projects located in the Beaufort Sea, Caspian Sea, Grand Banks, Gulf of Mexico, Labrador Sea, Scotian Shelf and offshore Sakhalin Island. In addition to his professorial responsibilities, he serves as a committee chair and member for the Canadian Standards Association Z-662 Oil and Gas Pipeline Systems standard and as the associate editor of the ASME Journal of Pressure Vessel Technology.

Making work environments safer

A new \$100,000 motion simulator – housed in the Faculty of Engineering and Applied Science – is giving Memorial researchers a better understanding of how to make working in harsh environments safer, marrying industrial needs with applied research.

The high-tech gear, which includes a small platform with steel rails mounted on a movable base, simulates potentially dangerous work environments such as offshore oil rigs, ships and airplane decks

It was recently purchased through funding from the Atlantic Canada Opportunities Agency (ACOA)'s Atlantic Innovation Fund (AIF).

It will be used by researchers across the university and is currently being put to the test by a group studying the effects of motion-induced interruptions and motion-induced fatigue.

Subjects will be strapped into a safety harness while standing on the moveable platform. From there, researchers will have an opportunity to examine their ability to maintain postural stability and study the cumulative effects of fatigue.

"It is difficult to replicate the motions observed in the North Atlantic – but we can come close to some of these with the equipment we have acquired at the university," said Dr. Scott MacKinnon, an associate professor in the School of Human Kinetics and Recreation (HKR) with a cross appointment in Engineering. He's also the co-director of SafetyNet and one of the main researchers working on the project.



Andrew Edwards demonstrates the motion simulator.

"Many operations, mental and physical, can be affected by the quantity and nature of the moving environment. The more we know about it, the more we can develop safer process systems."

Dr. MacKinnon is part of an interdisciplinary team – which also includes researchers from the Marine Institute, Engineering, HKR and the National Research Council – who are looking at how the body reacts to motion induced interruptions and exhaustion while working in motion-rich environments.

"The empirical research we can do in a laboratory environment can be used to assess real-time motions at sea," he noted. "An expert system can be developed to advise workers when conditions are becoming less stable thus creating an increased risk for accidents or injury.

"Innovation is a great catalyst," added Dr. MacKinnon, "but our goal is to make working in harsh environments as safe as working in your office or at home."

A research project will explore using fish oil as fuel



Dr. Kelly Hawboldt

A Memorial University research project will investigate the possibility of converting marine waste to an environmentally-friendly biofuel. With assistance from the Newfoundland and Labrador Green Fund, Dr. Kelly Hawboldt, an associate professor of engineering at Memorial, will determine the feasibility of using fish oil as a blend with petroleum-based fuel for powering fish plants and marine vessels.

Biofuels are fuels derived from plant material and residues such as agricultural crops, waste from animal processing, or by-products from agricultural or forestry initiatives. In cases where the quality of the biofuel oil required is lower and an engine is flexible in terms of fuel quality, the oil from the processing of vegetables and animals can be directly used for power generation and heating. There are lower emissions of greenhouse gases (GHGs) and other toxins throughout the production, use and disposal of these biofuels.

"There is significant potential in this province for animal and, specifically, marine waste to be converted to biofuels," said Dr. Hawboldt. "This research will go towards making biofuels more feasible in the province. The cost and transportation of fuel is challenging for many small communities and companies, and the onsite generation of an alternative fuel is both economically and environmentally advantageous."

Dr. Hawboldt added that while the total reductions of GHGs will depend on the type of conversion technology used, as well as the species of fish processed, 13 to 74 per cent reductions are possible. Furthermore, all other regulated emissions such as sulphur dioxide and particulate matter can potentially decrease by 10 to 50 per cent with biofuel use.

The other members of Dr. Hawboldt's research team include Dr. Robert Helleur from the Department of Chemistry, at Memorial University; Dr. Michael Pegg, a professor of chemical engineering and head of the Department of Process Engineering and Applied Science at Dalhousie University; and Heather Manuel of the Centre for Aquaculture and Seafood Development at the Marine Institute.

New harsh environment technology at Memorial



Roger Basu, director, research and development, corporate technology, with the American Bureau of Shipping and Dr. Ray Gosine, Memorial's vice-president (research) *pro tempore*.

Memorial has partnered with the American Bureau of Shipping (ABS) to establish a new research and development centre at the university. The ABS Harsh Environment Technology Centre will be located on the St. John's campus.

"The creation of the new centre will fill a void in research in support of our offshore industry. Creating a safer working environment for those employed in harsh conditions is pivotal to the economic growth of the industries directly linked to Canada's Arctic. Once again, Memorial is delighted to partner with ABS to take the lead in research and development in this important field," said Dr. Quicoe, dean (*pro tempore*), Faculty of Engineering and Applied Science.

The new centre will support the development of technologies for ships and offshore structures operating in harsh environments, particularly the Arctic. Applied research will be conducted to study vessels and units operating in ice covered waters, low temperature environments and severe wave and wind climates. It is envisioned that the research and development facility will become an established fixture on Memorial's campus.

Founded in 1862, ABS is a leading international classification society devoted to promoting the security of life, property and the marine environment through the development and verification of standards for the design, construction and operational maintenance of marine-related facilities.

ABS has a longstanding relationship with Memorial University having worked together on various research and development projects as well as maintaining an on-going student internship program for Memorial engineering students.

The signing of the Memorandum of Understanding took place October, 2009.

New Faculty

Dr. Bruce Colbourne, professor, Oct. 2009
Dr. Syed Imtiaz, assistant professor, March 2010
Dr. Baiyu (Helen) Zhang, assistant professor, April 2010
Dr. Weimin Huang, assistant professor, April 2010
Dr. Lesley James, assistant professor, July 2010
Dr. Yan Zhang, assistant professor, July 2010
Dr. Assem Hassan, assistant professor, Aug. 2010
Dr. James Yang, assistant professor, Sept. 2010

New Staff

Jinghua Nie, international officer (Graduate Studies), May 2009
Alvin Kenny, administrative staff specialist, Aug. 2009
Diane Coffin, administrative staff specialist (Grants and Contracts), Aug. 2009
Erin Collett, development officer, Sept. 2009
Gerard Brake, programmer consultant, Oct. 2009
Colleen Mahoney, intermediate clerk stenographer, Oct. 2009
Dean Barnes, manager, Engineering Computing Services, Nov. 2009
Michelle Alexander, research and development liaison officer, Dec. 2009
Shannon March, programmer, Jan. 2010
Vanessa Coish, intermediate clerk stenographer, Jan. 2010
Adrian Dobre, laboratory instructor, Jan. 2010
Suzette Winsor, intermediate clerk stenographer, Feb. 2010
Jocelyn Boone, intermediate clerk stenographer, July 2010
Monique Maynard, graphic designer, July 2010
Gillian Hiscock, intermediate clerk stenographer, July 2010

Milestone

25 years of service



Barb Elliott, manager,
Finance and Administration,
May 2010

16 Benchmarks

FALL 2010

Retirements



David Press, manager, Centre for
Computer-Aided Engineering, April 2009



Yvonne Murphy, administrative staff
specialist, June 2009



Prof. Michael Bruce-Lockhart, professor,
Aug. 2009

New Faculty Profiles

www.engr.mun.ca

MEMORIAL
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Faculty of Engineering
and Applied Science



Dr. Syed Imtiaz

On March 29, 2010, Dr. Syed Imtiaz joined the Faculty of Engineering and Applied Science as an assistant professor.

Dr. Imtiaz received his B.Sc. in chemical engineering from Bangladesh University of Engineering and Technology

(BUET), graduating first in his class. He then enrolled at the University of Calgary and obtained his M.Sc. in chemical engineering, with a specialization in environmental engineering. From there, he completed his PhD in process control from the University of Alberta.

His research interests include statistical process control and non-linear model predictive control.



Dr. Baiyu (Helen) Zhang

Dr. Baiyu (Helen) Zhang joined the Faculty of Engineering and Applied Science on April 1, 2010 as an assistant professor. She teaches mainly in the areas of environmental engineering and management, and environmental monitoring and analysis.

Dr. Zhang received her bachelor's and master's degrees in environmental science and technology from Jilin University in China and her doctoral degree in environmental systems engineering from the University of Regina. She was then awarded a two-year NSERC post doctoral fellowship.

Her research interests lie in development of environmental biotechnologies, remediation of petroleum contaminated sites and control of spilled oil, management of municipal/industrial solid waste, treatment of industrial wastewater, interactions affecting trace metal transport and northern environment studies.



Dr. Weimin Huang

On April 12, 2010, Dr. Weimin Huang joined the Faculty of Engineering and Applied Science as an assistant professor.

Dr. Huang received his B.Sc. and M.Sc. in radio physics and a PhD in space physics from the School of Electronic

Information at Wuhan University. He completed his M.Eng. and post doctoral fellowship in electrical and computer engineering at Memorial University of Newfoundland.

His research focuses on the mapping of oceanic surface parameters via high frequency ground-wave radar and, more recently, ocean surface target detection and tracking and wave and current information extraction from ocean clutter using microwave marine navigation radar.



Dr. Yan Zhang

On July 12, 2010, Dr. Yan Zhang joined the Faculty of Engineering and Applied Science as an assistant professor. She'll teach her students about mass transfer, downstream processing and compact process equipment design. Having just finished her postdoctoral fellowship at the University of Western

Ontario and making the move to Newfoundland, she's very excited about the opportunity this new position will give her to interact with students.

Dr. Zhang's research involves the application of experimental and computational methods to the analysis of various complicated separation and reaction processes.



Dr. Assem Hassan

On Aug. 23, 2010, Dr. Assem Hassan joined the Faculty of Engineering and Applied Science as an assistant professor. In his new position, he will be teaching his students about the materials of construction.

Dr. Hassan is a registered professional engineer in Ontario. He earned his B.Sc. and M.Sc. degrees in civil engineering from Ain Shams University in Cairo, Egypt, where he is from originally. He also has a MASc. and PhD in civil engineering from Ryerson University.

Dr. Hassan's research activities and publications deal with the rheological, mechanical and durability properties of self consolidating concrete (SCC), highlighting the areas of shear, bond, and corrosion of the reinforcing bars in concrete.



Dr. Bruce Colbourne

On Oct. 5, 2010, Dr. Bruce Colbourne joined the Faculty of Engineering and Applied Science as a full professor.

Dr. Colbourne received his B.Eng. in naval architectural engineering from Memorial

University of Newfoundland. He then obtained a S.M. in naval architecture from the Massachusetts Institute of Technology. From there he worked as a ship designer and consultant in the development of hovercraft icebreakers before returning to graduate study. In 1989, he received a PhD in ocean engineering from Memorial.

He is currently working on the STePS2 research project as a co-investigator and project manager. The project aims to improve the understanding of forces arising from ice impacts on ships and offshore structures.



Dr. Jianming (James) Yang

On Sept. 6, 2010, Dr. Jianming joined the Faculty of Engineering and Applied Science as an assistant professor. In his new position, he will be teaching engineering design.

Dr. Yang completed his undergraduate education at the Tangshan Institute of Science and Technology (now the Hebei Polytech University) in northern China before enrolling at the Southern Institute of Metallurgy (now Jiangxi University of Science and Technology) in southern China where he completed his master's degree. He began his professional career as a mechanical design engineer until he decided to pursue his PhD. In 2001, he was awarded a doctoral degree in mechanical engineering. He then spent another two years in Shanghai Jiao Tong University as a post doctoral student.

Dr. Yang's research areas are mechanical vibration, especially non-linear vibration; and quality control for automotive body.



Dr. Lesley James

On July 1, 2010, Dr. Lesley James joined the Faculty of Engineering and Applied Science as an assistant professor. She'll teach her students about process equipment design and natural gas handling equipment.

Dr. James has a BASc in chemical engineering from the University of New Brunswick, and a MASc and a PhD in chemical engineering from the University of Waterloo.

Her research involves enhanced oil recovery, transport in porous media and mass transfer.

MUN Engineering graduate Gillian Langor is a Rhodes Scholar

She was born and raised in St. John's, Newfoundland and Labrador, and stayed close to home when she chose to study engineering at Memorial University of Newfoundland, but now that Gillian Langor is a Rhodes Scholar, all that is about to change.



Gillian Langor

"Being a Rhodes Scholar is an incredible honour. The chance to study at Oxford is a once-in-a-lifetime opportunity that I'm very lucky to have. The values embodied by the scholarship set a high standard for academic/personal/societal achievement. Winning the scholarship is a dream come true, but studying at Oxford is the real test," said Ms. Langor.

With an engineering degree on her resume, she'll take this opportunity to pursue a different challenge.

"I plan to study social science of the internet at Oxford. I hope to pursue a career that reconciles my education as a mechanical engineer with my passion for international development and design," she said.

The mechanical engineering graduate has never been afraid of a challenge. During her time at Memorial she was very involved in MUN's Chapter of Engineers Without Borders where she travelled to Ghana and worked with the local government on programs aimed at improving the livelihoods of subsistence farmers. And after completing her studies in May 2009, she strapped on a backpack and set off for South America.

Ms. Langor would like to extend a sincere thank-you to her family, friends, professors and mentors for their incredible support over the years. The Faculty of Engineering and Applied Science has been particularly good to her. Her engineering education and relationships formed there are impossible to leave behind.

Ms. Langor was chosen as the Newfoundland and Labrador Rhodes Scholar from six highly-qualified finalists and while she says that winning the scholarship comes as quite a shock, there is no doubt she'll rise to the challenge.

Engineering student receives the 2009 Red Cross Young Humanitarian Award



Ian Froude receiving the Red Cross Young Humanitarian Award.

Ian Froude is a civil engineering student at Memorial University of Newfoundland (MUN) from the graduating class of 2010. A native of Twillingate, NL, he has shown leadership at home and abroad through volunteer work to bring about change and improve the lives of others.

Mr. Froude spent four months during the summer of 2006 in the Upper West Region of Ghana, Africa, with the organization Engineers Without Borders (EWB) Canada, where he worked with a local organization specializing in water access, hygiene and sanitation. Mr. Froude lived with a Ghanaian family during his stay, immersing himself in the culture and learning about the challenges of everyday life in the West African country.

He was president of the Engineers Without Borders' MUN chapter from January to December 2008. This involved heading a team of 10 executives who led about 40 other students to do advocacy, fundraising, behaviour change and school outreach in Labrador and across the island of Newfoundland, among many other programs. During his tenure, the MUN chapter was selected as the Volunteer Club/Society of the Year at MUN and also received the Chapter of the Year award among 34 chapters across the country.

Mr. Froude also co-chaired the ninth annual national conference for EWB Canada, which brought 400 delegates to St. John's and is one of the largest international development conferences in the country. He was also given the EWB Canada Volunteer of the Year award for 2009 at the conference.

Passionate about the outdoors, he is an avid cyclist and loves to hike, camp and travel.

Mr. Froude has just started working for EWB Canada doing leadership and student chapter development over the next several years.

As further evidence of his vision and forward-looking approach, after finishing work with EWB, Mr. Froude will be doing his Masters in International Affairs and is considering doing a law degree. Mr. Froude believes this additional education and experience will prepare him for a career in federal politics.

Engineering student receives Governor-General's Silver Medal for academic excellence



Andrew Myrden

If his future plans to make a positive impact on the world around him are indicative of how he approached his undergraduate studies at Memorial, then Mr. Andrew Myrden will undoubtedly do just that.

The St. John's native completed his undergraduate degree in electrical engineering last spring, and as a result of his hard work, he not only received his undergraduate degree at spring 2009 convocation but he also received the Governor-General's Silver Medal for academic excellence at the undergraduate level.

And while Mr. Myrden says he was surprised when he realized he had won the award, he quickly added that for him winning such an award is not only about hard work.

"Receiving this award is a tremendous honour. I didn't think I had any chance of receiving an award like this, so it was a very gratifying feeling when I opened my letter from Memorial and realized what it was for," he said.

"It's extremely rewarding to have my hard work recognized in this fashion. And, of course, receiving this award is also indicative of the amount of support I've had from my family, friends, and professors during my time at Memorial," he added.

Dr. Eric Gill is a professor of engineering at Memorial and was one of Mr. Myrden's professors.

"Andrew always demonstrated an exceptional mastery in all his courses. He was very enthusiastic and had a keen interest in understanding the fundamentals. There are some very promising individuals in this year's electrical engineering class; however, Andrew exhibited intellectual capabilities significantly ahead of most of his peers," said Dr. Gill.

Mr. Myrden started graduate school at the University of Toronto this past September where he is working towards a M.S. degree in biomedical engineering.

The Governor-General's silver medal is awarded to an undergraduate student obtaining a first degree, who stands highest in the graduating class and has an average of first-class standing.

Engineering students win Rookie of the Year at international baja competition



Memorial University Baja team.

The Memorial Baja team, which consists of junior and senior engineering students, travelled to Rochester, New York, this past June to compete in the Society of Automotive Engineers international competition (Baja SAE Series) held by the Rochester Institute of Technology. And with Rookie of the Year, first in the water maneuverability and 25th overall, the first-time entry from Memorial stole the show.

"We met our goals set out at the beginning and even exceeded them in the water competition. This has charged the team for next year. I am excited to see the passion that others have for the team and the amount of new people who want to join," explained Rocky Strong, the team lead.

Team Memorial Baja was created when Mr. Strong and fellow engineering student, Brian Tooktoshina, decided to hold a meeting to see how much interest there would be.

"As they poured in on the first meeting, we knew that we had a team that would be able to conquer anything. As time went on people began to dig in more and more. The team decided on goals, which were to build a durable car and place in the top quarter of the competition. We built a car that we were confident was built to the best of our ability, and went to the competition with pride and excitement, to show off our car, and our university," said Mr. Strong.

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/or water!

The object of the competition is to provide SAE student members with a challenging project that involves the planning and manufacturing tasks found when introducing a new product to the consumer industrial market. Teams compete against one another to have their design accepted for manufacture by a fictitious firm. Students must function as a team to not only design, build, test, promote, and race a vehicle within the limits of the rules, but also to generate financial support for their project and manage their educational priorities.

And, as Mr. Strong points out, when you participate in a competition like this, it isn't just about winning.

"It was about shaping us as engineers, allowing us to apply our learning in real world situations, and equipping us to be more effective when we enter industry. I never realized how much it actually would. There was one late night that we were all standing around and realized we had misinterpreted a rule, and it would affect us being able to compete. At that point I realized the impact of what we were learning. It wasn't just about applying technical knowledge, it was learning to work together as a team, putting egos aside, and solving problems. I realized at that moment that in this case it was just a competition, but in the real world it could mean millions of dollars or perhaps lives," he added.

The team hopes to compete again next year, when the competition is held in Montreal.

Engineering students compete in national toboggan races



Memorial University toboggan team.

Who says sliding is just for kids? This past January, 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) against 20 other teams from across Canada in hopes of winning the national title.

While only half of the team competed in Hamilton, the Red Green MUN Machine team consisted of 20 engineering students, mostly from the civil engineering discipline.

Fourth-year civil engineering student Max Day is the team captain and says that while they didn't do as well as they had hoped it was a great learning experience.

"Even though we didn't do so well, our spirits remained high and we learned what we have to do for next year," he said.

Since 1975, GNCTR has become the oldest and largest engineering competition in, 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.

First Lego League Robot Competition held at Memorial University



First Lego League (FLL) competition participants

This past January, the First Lego League (FLL), Newfoundland and Labrador, held its seventh province-wide tournament for junior high school students but there was something very different about this year's competition venue - this year was the first time the tournament was held on Memorial's St. John's campus.

The competition was held in the engineering building and the change in venue reflects a new partnership with Memorial's Faculty of Engineering and Applied Science, which perceives FLL as a valuable outreach program for encouraging students to engage in science, technology, engineering and mathematics (STEM). Prof. Andy Fisher is the associate dean of undergraduate studies for the Faculty of Engineering and Applied Science and is excited about the new partnership with the FLL.

"This is the type of active learning environment that can change the course of the future for many of these students. The competition themes get the students thinking about sustainability, the format gets them involved with technology and the team work allows them build those highly critical interpersonal life skills. It's a great opportunity to learn and have fun," said Professor Fisher.

The FLL competition challenges students in many ways and fosters a wide array of skills development. It also encourages their academic choices and achievement in fields which enable them greater career options. Most importantly, this competition demands that students use and develop creativity and problem-solving skills, which are needed to address the world's major issues and future challenges

There are 50 countries involved in the FLL program. This includes 14,600 teams and 146,000 students (team members). Further information on this event and its link to the global community may be viewed on the FLL website: www.firstlegoleague.org.

Memorial engineers host national conference



African Program Staff, those based in Ghana, Burkina Faso, Malawi and Zambia, dive deep into the intricacies of development work in rural Africa.

The Memorial chapter of Engineers Without Borders welcomed the largest international development event ever to the province this past January.

This past January, the 2010 Engineers Without Borders National Conference took place in downtown St. John's. During the event, the organization worked with 400 delegates from across Canada and Africa to better enable itself to create opportunities for rural Africans.

Conference sessions, such as a high school keynote presentation which was broadcasted live to 14 schools, reaching more than 4,000 students and a question-and-answer session with African development leaders contributed to EWB's goal of educating Canadians about the possibilities of working with Africa for change, instead of viewing it as a continent dependent on charity.

"That involves advocating the Canadian government to improve the way it delivers aid," said Ian Froude, the conference's co-chair, "while working with farmers in Ghana to turn subsistence farms into businesses, or mobilizing engineers to improve corporate social responsibility practices of Canadian companies, or helping communities in Zambia efficiently map water sources."

Faculty of Engineering and Applied Science participates in annual bridge competition



Dr. Dennis Peters chats with a family at the competition.

It's never too early to start talking to the youth in our province about a career in engineering, which is why this past March, the Faculty of Engineering and Applied Science participated in National Engineering and Geoscience Month Bridge Day 2010.

The event is part of National Engineering and Geoscience Month, and brings together junior high and high school students to test their previously-designed and constructed bridges made of popsicle sticks and glue. The high school students have a chance to win a Memorial tuition voucher and the entire day consists of science, engineering and geoscience activities for children of all ages.

In total, 277 students participated in this year's bridge competition from 14 different schools across the province.

Faculty of Engineering and Applied Science supports local science fair



Dr. Amy Hsiao presents the awards on behalf of the Faculty of Engineering and Applied Science.

This past March, the annual Eastern Regional Newfoundland Science Fair took place at the Marine Institute in St. John's and as with previous years, the Faculty of Engineering and Applied Science sponsored three awards for the best junior, intermediate and senior projects.

The best project in the junior category went to Mark Jackman of MacDonald Drive Junior High School for his project, "Buildings that stand earthquakes shaking the land." Anna Gosine, also of MacDonald Drive Junior High School, won best intermediate category for her project, "Why is it difficult to distinguish between the different vowels sung by a soprano?" And, best senior project went to Holy Spirit High School students Jonathan Hicks and Alyssa Hodder for their project, "Good Vibrations."

The event brings together more than 500 science students in grades seven to 12 in the Eastern Newfoundland School District.

Fourth annual Winter Charity Ball biggest success ever



On Friday, Feb. 12, engineering students at Memorial continue the tradition of giving back to the community as the Student Society 'A' held the fourth annual Winter Charity Ball in aid of Iris Kirby House.

The event was held at the Johnson Geo Centre and more than \$10,000 was raised, making it the most successful Ball yet.

Janelle Adams is the Student Society 'A' president and she is extremely pleased with how the night went and even more thrilled that this year's fundraiser marked the most successful engineering charity ball fundraiser yet.

"The Engineering student society's long-standing goal for the Annual Winter Charity Ball is to continue to give students a chance to give back to the community by supporting local charities, as well as continue to increase the funds raised every year. We are proud to say that to date; we have met this goal and hosted our biggest Charity Ball this past February in aid of the local Iris Kirby House. We thank all of our sponsors and guests for making the night a successful one," she said.

As with previous years, the fundraiser consisted of a three-course-meal, speeches, a silent auction and provided an opportunity to network with people from the engineering community, such as faculty and alumni.

Sponsors included the Faculty of Engineering and Applied Science; Professional Engineer and Geoscientists of Newfoundland and Labrador (PEGNL); Technip; RBC Royal Bank; Newfoundland Transshipment; Production Services Network; Pennecon Limited; Capital Subaru, Purity Factories Ltd. and The Cahill Group of Companies.

Swimming sensation



Dayna Hogan

She's an engineering student but her dream isn't to engineer their design. As Dayna Hogan stands next to the swimming pool at Memorial, it's her passion for swimming that brings her here time after time. And as a third-year ocean and naval architectural engineering student, juggling her studies, swimming and a social life can mean long days, but Ms. Hogan clearly has it all under control.

"It can be challenging sometimes. If I'm away at a swimming competition, it can take days to catch up with my studies, but you get used to it. I use my time well and complete most of my assignments during the daytime," she explained.

As part of the Memorial Seahawks Varsity Swim Team, Ms. Hogan travels regularly during each school year to compete in national and regional swim competitions. And, although there have been many competitions over the years, and many wins too, her very first swimming competition still puts a wide grin on her face.

"It was a regional competition in Corner Brook and I was in Grade 6. I remember that I went faster than one of the older swimmers. That was pretty exciting," she recalled.

Recipients of the Hira and Kamal Ahuja International Graduate Award

The recipients for 2009 and 2010 of the Hira and Kamal Ahuja International Graduate Award are Abdes Khan and Sridhar Sathyanarayanan, respectively.

The annual award is valued at \$1,000 and given to an international graduate student for academic excellence and volunteer work.

At age 11 she may have been swimming faster than some of the older swimmers but when she started swimming just two years earlier, she wasn't exactly a natural in the water.

"I wasn't very good at all and someone suggested to my parents that they should put me on a swim team because it would mean more one-on-one time with the coaches, so that's what they did," she chuckles.

And, apparently, it worked. She improved a lot through middle school and high school and even after coming to university. Ms. Hogan is currently training to qualify for nationals. She placed third in the 100 freestyle at the AUS Championships and was named Subway Athlete of the Week last fall.

Ms. Hogan encourages other students to have a life outside of studies.

"It's really good to be well-rounded. Swimming takes up a lot of my time and it has taken over my life but it has taught me skills that I could have never learned in a classroom. It has also given me many opportunities to volunteer and meet new people in the community," she said.

Once she finishes school, Ms. Hogan knows she'll have to trade in her swim cap for a hard hat, but she still plans to spend as much time as she can at the pool teaching younger swimmers.

Our youth and the world of science and engineering



Ben Colbourne and Katie Breen

Memorial University is now a major player in bringing the world of science and engineering into classrooms for youth in this province thanks to funding from the provincial government's Department of Innovation, Trade and Rural Development.

The project, which reaches out to youth to create awareness and to increase the level of interest in science, engineering and technology fields, was launched in participating schools this past winter.

The four partners involved include Memorial University's Faculty of Engineering and Applied Science, Distance Education and Learning Technologies (DELT) and Let's Talk Science Partnership Program, as well as the provincial Department of Education's Centre for Distance Learning and Innovation (CDLI).

The goal of the project is to empower and encourage youth to explore science and engineering concepts by using videos to pique students' interest. Specifically, the project focuses on the topic Science of Flight in the current Grade 6 science curriculum. Using facilities in the Faculty of Engineering and Applied Science, as well as students from the Bachelor of Engineering program, elementary concepts were captured on video and streamed from Memorial for use by students in a classroom environment.

The project outcomes include the production of two, comprehensive videos that capture the topic of flight in an effective and interactive way. The first video is interactive and describes flight concepts such as drag, lift, gravity and thrust, and "why airplanes fly." The second video is an instructional video of how to make and alter a model airplane for optimal flight. In addition to the video, model airplanes are made available and distributed to students to assemble during class.

With dedicated resources from the Faculty of Engineering and Applied Science and content experts from the Let's Talk Science Partnership Program, DELT designed and developed the video components to supplement the learning activities of the Science of Flight topic. CDLI played an advisory role and assisted in ensuring the product outcomes met the learning objectives of the science curriculum.

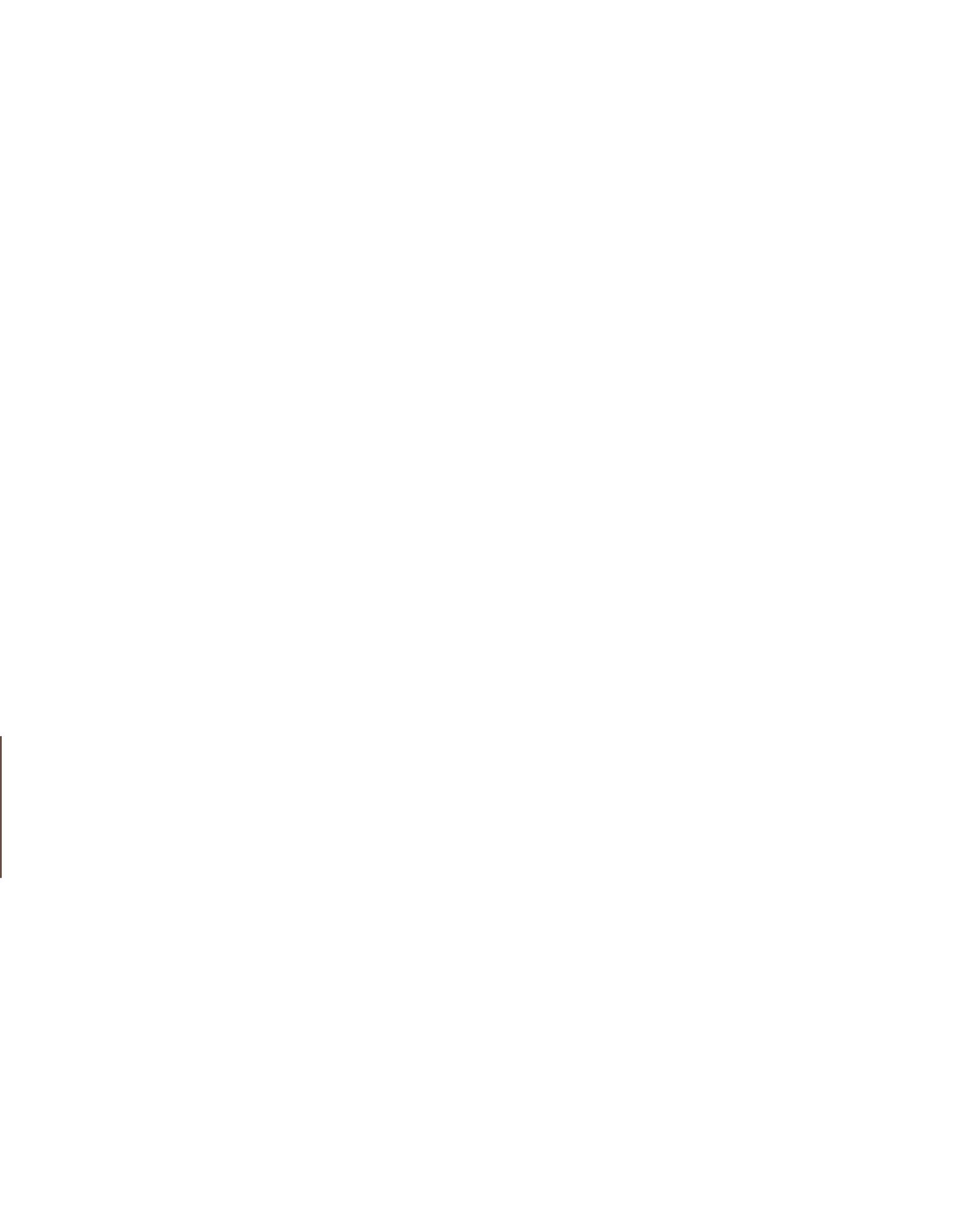
The success of both the collaboration and project outcomes has been recognized by all partners involved. As a result, the partners plan to continue the collaboration to ensure the project is sustainable as an educational tool for all schools in the province.

Students from Engineering Society 'A' hold the sixth annual Pi-Day in support of the Janeway Children's Hospital Foundation

On Monday, March 15 (since March 14 was on a Sunday), the Faculty of Engineering and Applied Science's Student Society 'A' held the sixth annual Pi-Day in aid of the Janeway Children's Hospital Foundation.

For the fundraiser, engineering student volunteers deliver cream pies around the St. John's campus and the City of St. John's to raise money for a local charity, which has traditionally been the Janeway Children's Hospital Foundation. Participants pay \$10 to have a cream pie delivered to anyone in the St. John's/Mount Pearl area and recipients can then choose to pay \$10 and have the pie sent to someone else.

A huge success again this year with more than \$1,200 raised.





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