

## Leadership

Flying high: industrial  
engineer at the controls

Any time, anywhere

Maintaining Canada's Navy

Alumni photo  
contest winners

 **DALHOUSIE  
UNIVERSITY**  
*Inspiring Minds*

*Faculty of Engineering*  
engineering.dal.ca

### From the Dean

As 2013 draws to a close and we enter into a new year, I would like



to take a moment and reflect on the past year and our successes. We've managed

to attract several talented new professors to Dal Engineering, the demand for our programs continues to grow, our graduates are finding great jobs, and we've recently appointed a new Canada Research Chair in Cold Regions Ecological Engineering. You can read all about the chairholder, Rob Jamieson and the work he's doing in this issue of *The Dalhousie Engineer*.

I would like to thank you all for your generous and thoughtful support over the past year and wish you and your families a safe and happy holiday season, and we look forward to seeing you at our alumni events coming up this winter.

**Dr. Joshua Leon, P.Eng.**  
Dean of Engineering

#### Contributors

**Editorial:** Mark Campbell, Terri Mann, Amy McEvoy, Jennifer Moore

**Photography:** Danny Abriel, Nick Pearce, Paula Tempelaars

**Design:** Jane Lombard

For more news and events visit:  
[engineering.dal.ca](http://engineering.dal.ca)

**Contact:** Jennifer Moore, Editor, Faculty of Engineering, [media.engineering@dal.ca](mailto:media.engineering@dal.ca)



**Find us on Facebook:**  
Dalhousie University - Engineering



### Joe Randell brings an engineering perspective to the aviation industry

If you want to break the ice with **Joe Randell** (BEng'76 Industrial), ask the president and CEO of Chorus Aviation and its wholly owned subsidiary Jazz why he is so passionate about the airline industry. Without hesitation, he'll tell you it's the way it brings people together. "It connects everyone," Randell elaborates. "We have the ability to move people all over the world, to be in different places. Also, there's a romantic aspect to flying."

Randell's passion for aviation is still going strong nearly 40 years after he started his first student work term at Air Canada. He's been through every change and challenge you can think of – start-ups, restructures, mergers – and his devotion has never once wavered. Today, he oversees Canada's largest regional airline and the country's second largest airline by fleet size. As he sums it up, "When you get to work in a business that holds a deep attraction for you, that's very rewarding."

Even so, it's not quite the career trajectory that Randell had in mind while

he was growing up in Corner Brook, NL. He wanted to be a pilot, an aspiration stirred in part by his grandfather, who took Randell along when travelling for the electrical contracting company he owned and to visit relatives in the United States. "I was keen on scheduling, logistics, design, efficiency and the use of technology in the industry," he recalls "These are all elements at the core of industrial engineering."

And so in 1974, during his third year of engineering studies at Memorial University, Randell decided to transfer to the industrial engineering program at the Nova Scotia Technical College. The two years that followed weren't easy, but he says they prepared him to take on the challenges of leading companies like Jazz and Chorus.

"That's the great thing about the program: it really prepares you to succeed in any field. It comes down to the emphasis on applying analysis and logic to every situation. We were encouraged by our professors to delve



into root causes and deal with issues in a comprehensive way. That really came in handy back in the days when I was planning airline schedules.”

Though Randell didn't get his pilot's license, he has proven to be an accomplished captain of the airline industry, starting with the foundation of Air Nova in 1986. Drawing on research projects he'd done while earning his MBA at Memorial, he convinced a small group of entrepreneurs to go in on this new venture and built it into a success. So much so that when Air Canada merged the local carriers it owned, which included Air Nova, he was asked to lead that initiative. That led to the creation of Jazz. And when Air Canada decided to spin off Jazz, it was Randell who guided the company's successful arrival in the publicly traded markets.

Navigating these changes wasn't always easy. One of the bigger challenges Randell has faced as a leader is how to motivate people during tough times. “It's easier to do that when you're starting or growing a company because that feels good. But I think

*“I was keen on scheduling, logistics, design, efficiency and the use of technology ... These are all elements at the core of industrial engineering.”*

I've been able to draw on my education and experience to encourage people to embrace change when things aren't good. If not, we wouldn't be here.”

Jazz has continued to soar under Randell's leadership, posting operating revenues of \$1.7B in 2012. The company operates approximately 740 flights daily to 54 Canadian cities and 25 destinations in the United States as a contract carrier for Air Canada, carrying 30,000 passengers every day. With that kind of performance, it's no surprise that Randell has also been asked to provide direction to other industry organizations. A past chair of the National Airline Council of Canada, Randell is currently the only non-American director on the US-based Regional Airline Association. He is a director of Discovery Air, which provides aviation and logistics services, and a member of the Atlantic Gateway Advisory Council. His accomplishments have also earned him honours such as induction into the Nova Scotia Business Hall of Fame. But he maintains that the recognition he values most comes from his team.

“When the people you work with are feeling good and motivated in what they do, that's the best.”

Randell also values family time. He and his partner, Norris Boudreau are – no surprise – avid travellers and outdoor enthusiasts. He's father to four grown children and about to be a grandfather for the fourth time. “I'm really happy to be healthy and to be able to enjoy life,” he says.

And he still enjoys his work, which means he won't be handing over the reins of Chorus and Jazz to the next generation any time too soon. “As long as I see that I can add value, I'll stay. We have a great executive team with great potential successors. I want to see these companies grow and diversify, so they continue to be a place of opportunity for others.”

But will he ever get around to earning that pilot's license? Randell laughs. “Maybe I'll just let someone else fly me around,” he says. Like every great leader, he knows when to delegate.



## In conversation with **John Chisholm**

### Nova Scotia businessman and Dalhousie honorary degree recipient

If you ask **John Chisholm** what he's passionate about, he's quick to reply. "My work is my passion. It's my hobby; for me it's not work."

A businessman and philanthropist with deep roots in Antigonish, Chisholm's dedication and contributions to his industry, community and Nova Scotia's economic prosperity have been recognized provincially and nationally. Yet for all the honours and achievements he has garnered, Chisholm remains incredibly humble.

"If I see a project that has the potential to give an economic boost to an area of the province, I'm happy to do it. That's really what it's all about."

The second oldest of six children, Chisholm found his passion early in life,

watching his father operate the family's construction operation (Chisholm Construction) and working on his grandfather's farm.

"There was always a job to be done," says Chisholm. "It was all about work, I suppose, and I enjoyed doing it."

In 1963, his father established Nova Construction Co. Ltd., and Chisholm joined the business a year later. Under Chisholm's direction, it expanded and evolved, earning a reputation for excellence through a variety of high-profile projects. They include extensive roadwork, mining and remediation, hydroelectric dam construction, granite aggregate production for export, and the expansion of the Antigonish Mall.

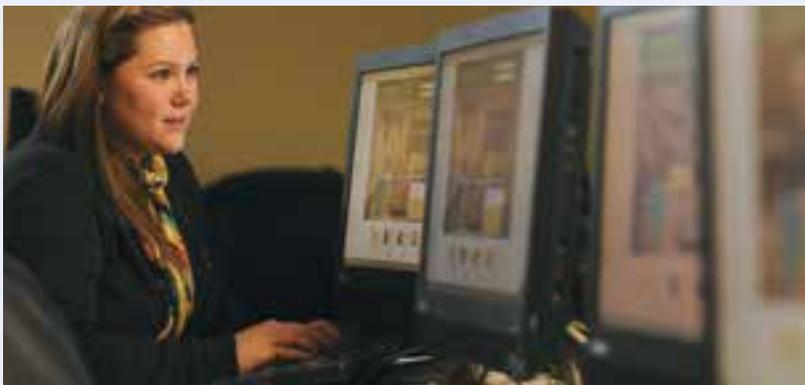
It is an impressive resume, even more

so when you consider that Chisholm undertook these projects in the true Maritime spirit of self-sufficiency.

"It's essential to create our own opportunities," he explains. "We've managed to employ 150–300 people for 50 years without government money. Yet it's become the norm now for companies to use up government money, and then they're gone. In my opinion, this isn't what government is for. It's been proven that it doesn't work. We must continue to find ways to sustain and improve the province."

With that kind of thinking, it's no wonder Chisholm has earned a reputation as a risk taker and pioneer. Take Novaminer, a private business approach to coal mining that he

## On the front lines at Jazz



**Elizabeth Croteau** (BEng '13, Industrial) is a big believer in a well-designed schedule, particularly when it comes to the workplace. "It ensures that everything that needs to be done is done efficiently and cost-effectively, but also

that everyone feels they have made a contribution."

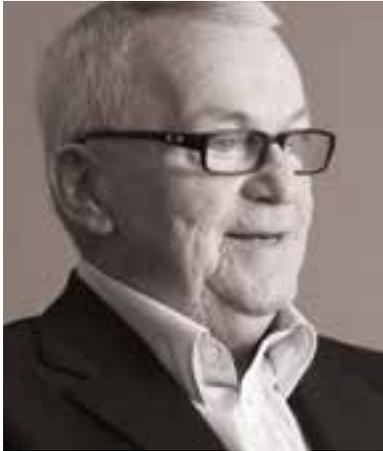
So it is no surprise to learn that Croteau is pursuing her Master's degree in Applied Science by working with Jazz Aviation to develop an algorithm to

bring the company's heavy maintenance scheduling into the 21<sup>st</sup> century.

"Traditionally, it's been done by hand," explains Croteau. "As you can imagine, it's often hard to keep track of what's going on."

Croteau is in the early stages of the project, gathering information on tasks and requirements to start developing the algorithm. She's aiming to have a prototype completed by December 2014 and her thesis for May 2015.

"It's exciting to be doing my master's in research-based work that could have a direct and measurable impact on an organization that thousands of people come in contact with every day. It will be cool to one day get on one of their planes and know they used my algorithm to schedule maintenance."



launched when industry players and government were getting out of the business because it was too expensive. It's a massive machine capable of highwall mining excavations up to 1,000 feet in length at seam slopes in excess of 20 horizontal degrees. The experts all said it could not be done, but Chisholm proved them wrong. He not only did it cost effectively and successfully, he created stable employment for many Nova Scotians in the process – jobs that otherwise would not have existed.

“Every day in business, it's all a risk, large or small. When you know something will work, it's easy for people to say it won't. That's the easy way out. People would describe us as doing crazy things, but once you make things work, it doesn't seem so crazy. And now we have the edge.”

More than a business leader who takes chances, Chisholm is a strong community leader with a legacy of generous donations to charitable and nonprofit organizations. In 2006, Chisholm made a significant gift to the Coady Institute of St. Francis Xavier University. Yet in a move that demonstrates his humility, he did it in the name of Nova Construction

employees, specifically Marjorie Desmond, a long-time nanny to the Chisholm family.

“Marjorie came to work at our house as a nanny when she was 15-years-old, and later cared for my children as well. She was a steadfast caregiver typical of the people we had working with us. She truly represents all of our employees

*“Success to me is knowing that, long after I'm gone, projects will continue ... and that the strides we've made to improve economic prosperity in the province will grow stronger.”*

past and present, and that is the reason why is why I choose to leave this legacy in her name.”

It's that spirit, and Chisholm's impact on Nova Scotia's economy that led Dalhousie University to present him with an honorary degree in engineering this past spring. The decision surprised Chisholm. “When you come out of

school with grade 10 and, more than 40 years later, you're given an honorary degree, you don't expect that. To go up to the podium with people much more educated than I was, well, that was a shock,” laughs Chisholm.

Even so, Nova Construction is celebrating 50 years in business, proving that Chisholm is a very sharp businessman. Yet he makes it clear he didn't reach this milestone by himself.

“We've had extremely good people working with us over the years.

Without them, I wouldn't have been able to accomplish anything. It's not about me; it's not about one. It's about a collective group of people all working together. You need that to run a company like this.”

Clearly, Chisholm has not just built roads and malls over the past 50 years; he's built a successful company, one he believes will continue to play a vital role in the province's economy for years to come.

“Success to me is knowing that, long after I'm gone, projects will continue, people will find meaningful employment, and that the strides we've made to improve and construct economic prosperity in the province of Nova Scotia will grow stronger.”

# On the leading edge with Joy Romero

**Joy Romero's** (BEng'79, TUNS) day starts pretty early – working at a production facility north of Fort McMurray, Alberta, she is at her desk before 6:30 am, and most days she can't wait to get there. As Vice President Technology Development for Horizon Oil Sands, Canadian Natural Resources, she works at the leading edge of science and engineering.

“Working in oil sands has given me an incredible opportunity to make a contribution. We are constantly reducing our environmental footprint, and implementing new technologies and new concepts; it's incredibly dynamic. As an engineer, it doesn't get much better than this,” says Joy.

From the age of about six, Joy had always known she wanted to become an engineer. Since taking engineering wasn't as common for women then, she instead enrolled in Honours Math. Taking many of the same classes as engineering students she quickly realized she couldn't be dissuaded from her dream – she wanted to be an engineer.

Motivated to catch-up, Ms. Romero took both first and second year engineering courses at once, at times

teaching herself the courses and doing the labs on her own when it didn't all fit into her schedule. “It was hard work and a very hard year, but it was doing what I wanted to do,” says Joy.

After completing her BEng in metallurgical engineering, Joy worked in iron ore in Labrador for several years before she, and husband Diego Romero (BEng'79, TUNS), moved to Sparwood, B.C. Joy took six years to stay home with her then young family. “You learn skills while you are at home listening, understanding, motivation: all are very transferrable and needed to function in the workplace.”

Joy returned to industry working in coal before moving to Calgary to do consulting for oil sands with SNC Lavalin. She enjoyed being a consultant but missed operations and being part of the whole sequence from design, to conception and construction- an opportunity that would come with working with Horizon Oil Sands.

In her spare time, Joy has always maintained a commitment to education- a thread throughout her life and career. From being a school trustee in Fernie, B.C. to chairing the Board of Governors



at Athabasca University, to facilitating knowledge sharing across her company, education has remained a core value.

“I never would have lived the life I have without education giving me the opportunity. I work hard and have a lot of drive but I would not be where I am without education.”

Today, as Vice President for Technology Development for Horizon Oil Sands, she ensures the operating facility has the technologies it needs for effective, efficient and safe production. Joy must always be looking ahead and developing new technologies that will meet the needs for future development and expansion plans. Joy also works closely with other oils sands producers through COSIA to innovate and share best practices for environmental stewardship across the industry.

Keeping up with the fast-pace and the enormous scale of oil sands technologies is no small task, but for Joy Romero, it is just another day at the office.



# Engineering the future: education through play

**Kelly MacDougall** (BEng '05, Environmental) has been keeping herself busy building hundreds of creations with LEGO® bricks since last April. The director of the Bricks 4 Kidz franchise in Halifax, Nova Scotia is – no surprise – loving every minute of it.

MacDougall says she and her husband learned about the program through friends while living in St. John's, NL on a temporary work assignment. Upon returning to Halifax, they discovered a market for the business, as there was no program for children that delivered the quality and calibre of enriched learning that this one did, particularly in the fundamentals of engineering.

As a professional engineer and mother of two young children, MacDougall believes it's vital to introduce S.T.E.M. (Science, Technology, Engineering & Math) concepts at a young age in a way that lets kids be kids.

The Bricks 4 Kidz classes are built around model plans designed by engineers and architects, and incorporate themes such as space and construction. Children are provided with an extraordinary atmosphere to further develop their organizational, fine-motor, and communication skills by collaborating with a partner or peers on a challenging project involving LEGO® bricks.

“Having the opportunity to positively influence children is incredible,” says MacDougall. “Our programs are hands-on and it's so rewarding when you watch children completely engaged in an activity, their cognitive skills developing

in front of you, and experience their pride and sense of achievement when they successfully complete a model build.”

“I've been very fortunate in the career path I chose. Engineering is a highly rewarding profession that is so full of opportunity. After spending eight years in the consulting industry, this business gives me an opportunity to teach children basic concepts of

The classes are also held in community centres throughout the HRM. In addition to enrichment classes, Bricks 4 Kidz also offers in-school field trips, camps, birthday parties and even corporate events. For more information or to enroll in a scheduled program, please visit [www.bricks4kidz.com/halifax](http://www.bricks4kidz.com/halifax) or contact MacDougall at (902) 240-2457 or [kmacdougall@bricks4kidz.com](mailto:kmacdougall@bricks4kidz.com)



engineering, allowing them to be creative and innovative and understand that engineering is fun!”

Currently there are five part-time instructors providing weekly enrichment classes in 10 schools and workshops at each EXCEL afterschool program, which includes 62 schools throughout HRM.

*Kelly MacDougall is director of Bricks 4 Kidz – a program which teaches the basic concepts of engineering through LEGO®.*

# In for the long haul

**Michelin has been offering Dal students hands-on co-op experiences for more than 30 years**

Co-operative education is, by definition, a mutual relationship between education and industry. Students get to apply their knowledge and skills, gain valuable experience, explore career options and build their resume over several paid work terms. In turn, co-op is an important resource for long-term recruitment for many employers.

Co-op is an essential recruitment strategy for Michelin North America (Canada). One of the largest tire manufacturers in the world, Michelin has nearly 3,500 employees across three tire manufacturing facilities in Nova Scotia. With 30 years of co-op participation, the company currently hires up to 12 co-op students locally per year.

“I applied to Michelin because it has a reputation of providing students with

meaningful and relevant work, as well as helpful guidance and feedback,” says Dalhousie industrial engineering student Jillian Withers, who completed a work term with Michelin in 2012.

In the last five years, 40 per cent of new Michelin hires were former co-op students, among whom retention rates are above average. Dalhousie industrial engineering alumni Jeff MacLean completed a work term with Michelin in 1987 and was recruited upon graduation.

“The opportunity to live and practice skills I was learning in university, in a real-life environment, not only allowed me to understand how to use these skills and understand their importance, but also helped when I returned to school,” says MacLean, now a plant manager



*Jeff MacLean, BEng'88 (Industrial)*

at Michelin's production facility in Pictou County. “I was able to focus my core learning on the key skills and tools needed for my future responsibilities.”



Michelin co-op students oversee a project from beginning to end, and get to witness their contribution in action.

“I had the opportunity to support industrial engineers, as well as complete one project of my own,” says Withers.

In exit surveys performed at the end of their co-op, students often mention the opportunity to contribute meaningfully during their work term.

“I loved how I got to design a project, see the design get made, and then I even

got to help install it,” said one student in their survey. “I know a lot of places aren’t like that and I just thought it was awesome to actually see my idea get implemented into Michelin’s machines.”

In addition to enhancing their education, co-op students engage seasoned professionals in their field, receive mentorship and build connections within the industry.

“My co-op term also gave me a number of very important mentors and

made my final career choice simple,” says Maclean. “I knew what I was accepting when I said yes to an offer of full-time employment with Michelin.”

“Everyone was always happy to help me and made me feel welcome in the workplace.” says Withers, who highly recommends Michelin as a co-op employer. “It’s an excellent learning experience and gives students the opportunity to do something challenging and worthwhile during their term.”

## Hire new energy.



### Hire a co-op student.

- Gain new knowledge and fresh perspectives.
- Ease human resources needs and reduce permanent recruitment costs.
- Fulfill operational objectives for special projects, peak periods, vacation or leaves of absence.
- Engage young talent suitable for long-term recruitment.

Science, Information Technology, Engineering Co-operative Education  
902.494.6083 | [coopjobs@dal.ca](mailto:coopjobs@dal.ca)

da .ca 

Post your co-op job today:

[myCareer.dal.ca](http://myCareer.dal.ca)

 **DALHOUSIE  
UNIVERSITY**  
*Inspiring Minds*



# Any time, anywhere:

## Dal engineers support Maritime Forces Atlantic

*The Dalhousie Engineer* magazine was recently invited to visit the Fleet Maintenance Facility Cape Scott, in Halifax, to see how Dalhousie engineers are contributing to Canada's navy. We spent the day touring Canada's largest military industrial complex with more than 20 Dalhousie engineering alumni, both civilians and military, who work in every aspect of engineering operations from command and control systems, to naval architecture and ship mechanics to weapons and combat systems.

Keeping Canada's Atlantic fleet at the ready, any time and anywhere, requires a

skilled and dedicated team of engineers, and we were fortunate to spend time with several of FMF Cape Scott's finest.

It is an interesting time for engineering teams at FMF Cape Scott as the fleet undergoes modernization. A massive undertaking by any standard, engineering teams face challenges of integrating old and new systems, working on ships on two coasts, and maintaining the highest levels of communication and coordination across all disciplines.

"Maintaining an operational fleet of navy ships brings about numerous

*Aboard the HMCS Windsor: Many Dalhousie Engineering graduates work on our Canadian submarine program. (L to R) C. Davis (Mech'08), P. Smith (Elec'88), L. Jeffery (Mech'09), A. Marshall (Elec'09), D. Lemieux (Mech'95), D. Rutherford (Mech'87), G. Pelletier (Matl'00), M. Pike (Matl'10)*

engineering challenges. Fortunately, with the operational experience of the military engineers and the technical experience of the civilian engineers, success is the norm." says Gigi Pelletier (MASC'02, Materials).

Now the Submarine First Level Systems Engineer on the Victoria class submarines, Gigi got her start here as a co-op student. Once she started working with the submarine program, she knew she had found her niche and her excitement for her work is obvious; she says taking part in submarine sea trials was a career highlight.



“The submarine community is a unique community. The smaller vessel and crew lend themselves to a more intimate environment. The distinctive purpose and mission of a submarine brings exclusive engineering challenges.” says Gigi.

Catherine Courtney (BEng’03, Mechanical) also works with the submarine program, “The first thing people say when you tell them you work on submarines is ‘wow, we have submarines?’ and I tell them ‘Yes, and they are operational.’ Even after working here for eight years, I don’t think the coolness factor will ever wear off, it’s an exciting place to work.” says Catherine.

FMF Cape Scott provides a fast paced work environment for engineering teams, “Its very hands-on, you can walk down to the ship and see what’s going on, the problem is right in front of you.” says Catherine. “Its a great job and its great to have this opportunity right here in Halifax.”

Navy maintenance engineers are also working with state-of-the-art equipment. One of the newest technologies they are using is known as Laser Additive Manufacturing. This technology is similar to the plastic 3D printers, only using metal. One of only a handful of such machines in Canada, it allows them to build up metal parts with greater speed and complexity than

conventional machining processes. “This technology revolutionizes manufacturing.” says materials engineer Matthew Pike (BEng’10, Materials) enthusiastically.

Like several of his colleagues Matthew started at the naval dockyards as a co-op student. Now an Engineer in Training, Matthew says working with the navy has provided him with opportunities to learn both on-the-job and through industry accredited training. “The submarines provide a lot of unique technical problems that require innovative solutions. For a young engineer, I have been able to gain excellent experience problem solving new solutions for challenging problems.”

Developing new naval maintenance engineers is a priority for the Canadian Navy, and staff at FMF Cape Scott are at the forefront. Elizabeth Blanchette (BEng’84, Electrical), Staff Officer Engineering and Maintenance, developed Cape Scott’s EIT program which has now grown to become a national program.

Mentorship with senior engineers is the cornerstone of the EIT program as it aims to bridge the gap of age, experience and institutional memory loss.

“The breadth of technology available here would be exciting for new engineers, as well as the opportunities to go on ships, work with major weapons, power generation, material for hull or part replacements, control systems.” Says Elizabeth. “From a management point of view, I appreciate the enthusiasm and new knowledge our EIT’s bring—they constantly push us to use new knowledge, new technology or to think a new way.”

“It’s important to be looking ahead, to the next generation of ships coming after this one, another class and to be sure we’re prepared with the next generation of navy engineers.” echoes Douglas Reid (BEng’00, Electrical), Section Head Command and Control Systems.

“What makes it rewarding is that we get to explore new things that keep the fleet going. But also, to be at a point now in the process where we will see the modernized ships return to active duty; that’s exciting.”

*We are interested in what our alumni are doing; if you would like us to feature your team or workplace in an upcoming issue of The Dalhousie Engineer magazine, please contact us at: [media.engineering@dal.ca](mailto:media.engineering@dal.ca)*





# Where in

Alumni photo contest: and t

**First place:**

**Quiet Valve on a Quiet Prairie  
Morning**

**Belle Plaine, Saskatchewan, July 2013**

**Heather Sinclair (BEng'03, Industrial),  
Calgary AB**

*This valve may look like simple equipment, its lifecycle isn't simple at all! Industrial Engineering helps improve efficiency; managing the operation and maintenance of valve equipment gives industrial engineering plenty of opportunities.*

In our Spring issue we asked our readers: *Where in the World is Dalhousie Engineering?* Alumni and current students alike responded by submitting remarkable images captured during their careers, work assignments and world travels. We received entries from as far away as Australia, China, Africa, and the Ukraine. These photos illustrated both fascinating engineering challenges and equally diverse locations around the globe where our engineers find themselves living, working and making a difference. Thank you to everyone who entered and congratulations to our winners!

Thank you to our panel of judges for their participation: **Nick Pearce** (professional photographer, Dalhousie University); **Sandra MacAulay Thompson** P.Eng. (Engineer in Residence, Dalhousie University); **Holly Agra** (graduate student, Mechanical Engineering, Dalhousie University)

Look for our next photo contest soon.

# the world is Dalhousie Engineering?

the winners are...



**Second place:**  
**Ferry Terminal at Bekopaka, Madagascar**  
 Near Bekopaka, Madagascar 2013  
**George White (BEng'78, Mechanical), Toronto ON**

*I lived and worked in Madagascar from 2008-2012 working with Sheritt International's mining operations. In 2013, I took a trip to the Tsingy natural reserve in west Central Madagascar. This ferry terminal was the docking area for our river passage to the Tsingy.*



**Third Place:**  
**Night Sky in the Tanami**  
 The Tanami Desert, Northern Territory, Australia, August 2013  
**Joshua Hadskis Gordon (BEng'10, Mineral), Geelong, Victoria, Australia**

*Working at one of the most remote mines on the planet, you're able to see the Milky Way shine with its true brilliance. I feel lucky to be an engineer who travels the world and works in unique places.*

## Honorable mentions

**David Smith**, (BEng'71, Industrial), Halifax, NS; **Alex Hayes**, Masters student, Halifax, NS; Nick Grandy, student, 5th-yr. Chemical, Halifax, NS; **Simone Lemieux**, student, 5th-yr. Mechanical, Williamswood, NS

You can see their photos on our alumni page at [dal.ca/engineering](http://dal.ca/engineering)

# Northern exposure

## Wastewater research in the arctic

Growing up in Tatamagouche, Rob Jamieson was an avid reader of Farley Mowat's tales of Canada's north and dreamed he would one day visit the frontiers he encountered in those books.

Today, the newly appointed Canada Research Chair in Cold Regions Ecological Engineering is living that dream. Since 2010, he has been travelling to the arctic as the lead on the Nunavut Wastewater Research Project, and the experience has been everything he hoped it would be.

"It's a fascinating region," says Dr. Jamieson. "Nunavut is completely above the tree line, and that makes for a beautiful but imposing landscape."

It's particularly imposing when it comes to wastewater treatment. Traditionally, communities in the north have relied on passive systems, such as large ponds, which are frozen over nine months of the year. In summer, those ponds thaw and bacteria and algae facilitate treatment of the waste, helped in part by 24-hours of solar radiation in some areas.

But there are many unanswered questions about these systems, such as



*Rob Jamieson, Canada Research Chair*

how effective they are, how they can be optimized and the impacts they have on environmental and human health. Dr. Jamieson, along with researchers from the Dalhousie Centre for Water Resources Studies, is working with the Government of Nunavut to address those questions, and to see if these systems meet new federal regulations governing treatment.

"There are very few people conducting research on wastewater in northern climates," says Dr. Jamieson, who acknowledges he and his colleagues are, to some extent, pioneers. "That makes this one of the most

comprehensive research projects of its kind in the world."

Though it is relatively early in the study, Dr. Jamieson says they have made a few vital determinations. "We've looked at systems used in six communities across Nunavut and found that a properly engineered passive system can meet regulatory requirements and produce effluent that, when discharged into the marine environment, has little impact on environmental health."

Dr. Jamieson says it was an honour to be appointed a research chair, adding that it has provided vital funding that



has made this project possible. The appointment has also raised Dalhousie's profile as a leader in water-related research. "This is one of the only institutions in Canada looking at water and wastewater in the north, and the appointment has helped established us as the place to be if you want to explore these issues."

That's already starting to happen as other northern Canadian communities reach out to Dr. Jamieson and his colleagues about their groundbreaking research. Thanks to his appointment, that research will extend beyond 2015 when his current contract with the government of Nunavut will expire. He appreciates the opportunity to continue his work, given the development occurring and planned for the arctic region.

"We need to make sure, as development proceeds, that we can protect marine and freshwater ecosystems in the north and do it without burdening northern communities with infrastructure that they can't afford or manage. That's why this research is so vital."

## Dalhousie University and Strathclyde University research collaboration in tidal energy

The Departments of Mechanical Engineering at Dalhousie University and Strathclyde University launched a collaborative research initiative in tidal energy in July. Ms. Robynne Murray, Tidal Energy Researcher and Dalhousie PhD student, along with her supervisors Dr. Mike Pegg and Dr. Darrel Doman, travelled to the UK for the signing of the Memorandum of Understanding.

The Dalhousie-Strathclyde agreement allows Dalhousie Engineering to jump-start its tidal energy research program. This collaboration brings together the research capacity and engineering experience needed for the development of next generation, lower cost, higher performance tidal rotors.

Partnering with Strathclyde's internationally recognized research group provides Dal researchers with access to the renowned Kelvin

Hydraulics laboratory for testing turbine rotor blade designs. Ms. Murray recently spent four months with the UK team, while this spring, Strathclyde PhD student Katie Gracie will come to Dalhousie to continue her research here for four months.

Both Dalhousie and Strathclyde universities are located near some of the best tidal energy sites in the world. The Bay of Fundy in particular provides researchers with local access to dynamic and reliable testing environments ideal for testing these prototype systems.



*Dal Engineering professor Mike Pegg with Strathclyde Dean of Engineering Scott MacGregor*



### Listening to Dal Engineering

During his first 100 days as president, Dr. Florizone met with, and listened to, members of the Dalhousie community – both internal and external. The purpose of this initiative was to hear the ideas, concerns and aspirations of the many people who make up the Dalhousie community.

*Faculty and staff meeting Dr. Florizone in the Alumni Lounge, Sexton Campus*

# Meet our new faculty

*“Engineering is an evolving discipline that reinvents itself time and time again as we explore and create new solutions to new problems. Our Engineering curriculum and research activities continue to expand in breadth and depth and we are pleased to welcome four new talented faculty members to the Faculty of Engineering.” – Joshua Leon, Dean*



## Dr. Jean-Francois Bousquet

**Dr. Jean-Francois Bousquet** recently joined Electrical and Computer Engineering as an assistant professor and has been teaching Circuit Analysis as well as overseeing senior year design projects. His research interests include analog and mixed-signal integrated circuit design, digital communications as well as channel characterization and estimation. Dr. Bousquet also serves as a faculty member with the Ultra Maritime Digital Communication Centre, where his responsibilities include the development of novel signal processing techniques for underwater acoustic communications.



## Michele Hastie

Originally from Ottawa, **Michele Hastie** came to Halifax in 2012 to work at Atlantic Purification Systems in Environmental Sales. She joined the Process Engineering and Applied Science department this past summer, and is focused on bringing her teaching talents to introductory courses. Passionate about students and learning she incorporates the latest teaching methods and is always looking for new and interesting ways to engage students. Michele completed both her undergraduate and masters degrees in chemical engineering at the University of Ottawa.



## Dr. Azadeh Kermanshahi-Pour

**Dr. Azadeh Kermanshahi-Pour** is new to the Process Engineering and Applied Science department and looks forward to teaching a course in Air Pollution Control. Prior to joining Dalhousie, Dr. Kermanshahi was an NSERC postdoctoral fellow at Center for Green Chemistry and Green Engineering at Yale University. Her research is centered on derivation of biofuels and chemicals from renewable resources. Dr. Kermanshahi-Pour also served as a research associate at Western University and as a process engineer in a water and wastewater treatment company in Tehran, where she was responsible for designing wastewater treatment systems.



## Dr. Dimitry Trukhachev

**Dr. Dimitry Trukhachev** is an assistant professor in the Electrical and Computer Engineering department, and is currently teaching Digital Transmission Theory. Dr. Trukhachev received his Ph.D. in Electrical Engineering from Lund University, in Lund Sweden. Prior to joining Dalhousie, Dr. Trukhachev held postdoctoral fellow and research associate positions at the University of Alberta. In his free time Dr. Trukhachev likes to solve Olympiad contest problems in mathematics and programming. In his school years he participated in several Russian mathematical competitions and in the ACM (Association for Computing) World Programming Contest.

## Amyotte to head Engineers Canada

Elections are nerve-wracking experiences. Just ask **Dr. Paul Amyotte**. The Department of Chemical Engineering professor and C.D. Howe Chair of Engineering was on pins and needles as he waited to hear whether he'd been chosen as President-Elect of Engineers Canada at the organization's AGM last spring.

"It was stressful because you make a speech to the executive board and then everyone votes on the candidates," explains Dr. Amyotte, who has served on several Engineers Canada boards, including the executive. "I was relieved and happy to hear I'd been trusted with such a key leadership position."

As a past president of both the Canadian Society for Chemical Engineering and Engineers Nova Scotia, Dr. Amyotte certainly has the leadership expertise to take on this role. He also has considerable passion and commitment to build consensus and advance the profession. But he admits that he would not have put his name forward

without the support of his employers, his provincial association or his family.

"This is a labour of love for me, but I couldn't have done it without knowing that Engineers Nova Scotia, the Dean and the Program Chair at Dalhousie and my wife and children stand behind me 100%. That was the most important consideration for me."

Dr. Amyotte first became interested in leadership roles as a student at the Royal Military College of Canada in the 1970s. Constantly challenged to step up and take charge, the experience inspired him to look for and take on opportunities to give back, starting with his profession.

"It's not about ambition," he clarifies. "I am not out to leave a legacy. I think if you go into a leadership position looking to make a big change, it's not always realistic. I see Engineers Canada as a continuum, and my goal is to help it maintain momentum with key initiatives. It's really about keeping the ball rolling, making incremental progress."



In that spirit, Dr. Amyotte is looking forward to becoming president of Engineers Canada at its AGM next spring and to working with colleagues across Canada to strengthen the profession.

"The one thing I've discovered through my involvement with this organization is that, despite our regional differences, we have a lot in common. By coming together and talking about these connections, we can achieve a great deal."

## Alumni support makes it possible.

**DALHOUSIE**  
**FUND**  
REACHING  
FURTHER

Support from the Dalhousie Fund permitted our Dalhousie Supermilers team to achieve a 9th place team best at the Shell Eco-marathon Americas competition. Thank you!

Allison Chua, BEng'11, Master of Engineering student

 **DALHOUSIE**  
**UNIVERSITY**  
*Inspiring Minds*

Please support the Faculty of Engineering today.  
giving.dal.ca • 800.565.9969

# Campus News



## Engineering team at the National Mining Competition (NMC):

A team of four Dal engineering students travelled to Saskatoon, Saskatchewan to compete in the National Mining Competition. The event is intense. Students are given 36 hours to develop a solution and written proposal before delivering a preliminary presentation the following day. Dal's team, Chris Dean, Adam Stockermans, Shelby Pottle, and John Kushneryk, placed second in their division, and took second overall in the safety challenge.

## Dal Formula SAE takes it abroad

For the first time ever, the Dalhousie Formula SAE team participated in the Silverstone Circuit, UK. The team competed in Formula Student, a series of events that ran from July 3-7. Out of the over 100 teams competing, they were the only North American team represented.



*Graduate NSERC Reception: Award recipients, their guests, and faculty attended a congratulatory reception at the Halifax Club in November.*

# Events & Highlights

**Homecoming 2013** was a great success. Alumni made their way back to Sexton campus from October 3-5. The Faculty of Engineering was delighted to welcome back the class of 1963, who celebrated their 50th class reunion. NSTC alumni, Lyle Bryson and Murray Nelson worked closely with Terri Mann, (Alumni Events) and put together a fun-filled three day event.

The highlight for many was simply getting together again in the T-Room – a familiar tradition. Guests enjoyed a brunch and a class dinner along with a beer tasting in the Alumni Lounge. Throughout the reunion, stories and memories were shared, and friends reconnected. Mark your calendars now for Homecoming 2014, October 2-4, when the Class of 1964 will celebrate 50 years.



At the **Dean's Coffee Club** in November, attendees participated in a hands-on workshop. They were required to take apart a kitchen aid mixer, and put it back together, in working order!



**NSTC Engineering Class of 1963 – 50 Year Pin** (Front row / to r) Wes Campbell; Ron Smith; Don Gillis; Gerald Bishop; Lyle Bryson; Tom Reid and Phil Henderson (Back row / to r) Robert Gosse; John Pike; Tom LeFeuvre; Murray Nelson; Murray MacPhie; Les MacPhie



**Class of '63 Sexton Reception:** (l to r) Phil Henderson; Lyle Bryson; John Pike and Tom Reid [1963 NSTech Hockey Team members]



**Class of '63 Dinner:** (above) Vera and Gerald Bishop; (below) Phil and Judy Henderson



**Tech Room-mates:** (l to r) John Pike; Phil Henderson; Murray Nelson and Lyle Bryson

Be sure to visit [www.engineering.dal.ca](http://www.engineering.dal.ca) to find out about various alumni events and receptions across the country, making it easy for you to keep in touch with each other and Dal Engineering.

## Calgary Engineering Reception



### Camp 18 Iron Ring Ceremony

Professor **Mike Pegg**, was in Calgary during the Camp 18 Iron Ring Ceremony. He was proud to present graduate students Anita Nour (*above*) and Amir Naji with their rings.

### Upcoming events:

#### Sexton Ski Day – Wentworth NS Saturday, February 22

Please join us and bring your family for a ski day at Wentworth. There will be a special group rate along with après ski appetizers and cocktails in Ducky's Lounge.

#### Engineering Alumni Ski Day – Sunshine Village, Banff, AB Saturday, April 5

Please bring your families and join us again this year at Sunshine Village. There will be a special group rate and an après ski event for all ages.

*To register, please contact Terri Mann at [terri.mann@dal.ca](mailto:terri.mann@dal.ca) or 902.494.1378*  
*For a full list of upcoming events, please visit: <http://www.dal.ca/engineering>*

# Class Notes

## 1950's

**John Vachal, BEng'53 (NSTC mechanical)**, has been enjoying his retirement from Boeing since 1995. He can be reached at [jvachal@hotmail.com](mailto:jvachal@hotmail.com).

**John D. MacDonald, BEng'59 (NSTC electrical)**, is happily retired, he and his wife Margaret Martin, live in Mississauga and spend the winter in Sarasota, Fla. They have five children and ten grandchildren. Their son Paul is a Dal Engineering grad and their grandson Todd is also an engineer. John is happy to hear from his classmates and can be reached at [macnet30@hotmail.com](mailto:macnet30@hotmail.com)

## 1960's

**Frank Gervais, BEng'61 (NSTC civil)**, was presented with the Distinguished

Community Service Award by Saint Mary's University Alumni Association during Homecoming 2013.

**Edison Trask, BEng'61 (NSTC civil)**, writes: Being a civil engineer I do things to check the accuracy of my surveyor's eye. This past November my mixed curling team

was lucky enough to win a trophy at the Opening Bonspiel in Cornwall, Ontario. We have quite a few engineers in our club, and I would like to locate some other grads and have a reunion bonspiel. I can be reached at: [derek1962sep@live.com](mailto:derek1962sep@live.com).

*Photo below: From L to R, Ed Trask, Donna Spagnola, Denis Carter, and Joann Hurrell.*



**Michael J. E. Shefflin, BEng'62 (NSTC civil)**, was recently made a life member of The International Federation of Municipal Engineering (IFME) at the World Congress in Helsinki. He also served on the board as President representing United States and Canada, from 1988-1991, and in other capacities until 2012.

**Louis Bernard, BEng'63 (NSTC mining)** This is the 50th year that Louis has been engaged in mining and metallurgical projects worldwide. Having a BEng in mining as well as a MEng in extractive metallurgy, has given him the ability to work in both fields with competency. Louis has also crossed over into geological exploration where he managed a million-dollar program. Through the years he has provided engineering services around the world, and continues to do so with no thought of retiring. He would like to wish his classmates all the best.

**Wally Farrah, BEng'68 (NSTC mining)**, is retired and lives in Sussex, NB. He spends the winter golfing and walking the beach in Cocoa Beach, Fla. He hopes to hear from classmates: Craig Bowyer, Charlie Lush, Sam Clowser, Terry Meisner, David Brown, Dave Urquhart, Denis Merner and Woody Sangster at [wgfarrah@yahoo.ca](mailto:wgfarrah@yahoo.ca).

## 1970's

**Donald J Peters, BEng'72, (NSTC industrial)** has recently retired from Horizon Health Network in New Brunswick, ending a 36-year career as a healthcare executive. For the past 5 years, he served as President/CEO at Horizon, one of the largest in the country. Horizon Health Network has 13,000 employees, 1100 Physicians and an annual operating budget of \$1.2 billion. Donald also held senior executive positions at the old

Halifax Infirmary, Capital Health and was CEO of the Dartmouth General and Hants Community Hospitals. Donald now resides in Fall River, NS.

**Romaine Cook, BSc'72, BEng'74 (NSTC)**, spent his entire career with NSP Inc., and retired in 2004. He lives in Halifax, and spends the summer at his cottage on Big Mushamush Lake, Lunenburg County, with family and friends. He has three children and seven grandchildren. Romaine enjoys spending time with family, traveling, gardening, skating, playing hockey, reading and watching TV as time permits. He would love to hear from former classmates. His email address is [rlcook@eastlink.ca](mailto:rlcook@eastlink.ca).

**Doug Evans, BEng'76 (NSTC chemical)**, has recently co-authored a book titled: *Process Safety Management, Leveraging Networks and Communities of Practice For Continuous Improvement*. The book represents collective knowledge and experience in the deployment of networks within organizations to share process safety standards; best practices and learning between different work

groups. Doug is proud to have made a contribution to making the world a safer place based on his 37 years of experience in the oil and gas industry.

## 1980's

**Ben Ting, BEng'84 (TUNS)**, is currently working in Indonesia as General Manager of PT Graha Rajawali Pratama, a supplier to utility company Perusahaan Listrik Negara (PLN).

**Tony McFadden, BEng'85 (TUNS electrical)**, In November 2013 his eighth book was released; a soft science fiction adventure titled *Have Wormhole, Will Travel*. Tony's website can be found at [tonymcfadden.net](http://tonymcfadden.net)

**Waldemar Kunysz, BEng'89 (TUNS electrical)**, recently received his PhD in Electrical and Computer Science Engineering from The University of Calgary. Waldemar was also awarded the GPS World Leadership award in the Services category. (see photo below). He is currently working at NextNav LLC, developing technologies related to NextNav's new terrestrial based



Alan Cameron (left) congratulates Waldemar Kunysz, NextNav LLC, on his GPS World Leadership award in the Services category.

## In his own words: Bill Christie (BEng'50, Electrical)

*We recently received this letter from Dalhousie Engineering alumnus Bill Christie. A retired Rear Admiral in the Royal Canadian Navy, Bill shares his reflections on his life and career, in his own words...*

As I now enter my 94th year, I feel that I should send you a note as a Dal alumnus, while I am still able to do so.

Having been brought up in Digby, NS I completed grade school at the Digby Academy in 1936 and then after Radio School in Halifax, found employment in ships of the Canadian and British Merchant Marine.

Entering Dalhousie in 1946, I was a member of the first WW2 vet category, starting in Engineering under the Theakston regime and getting my engineering diploma in 1948, and graduating BEng at TECH in 1950. During these years I was a serving member of the RCN, spending my summers on active duty aboard HMC ships. I had joined the Navy as a S/ Lt(SB) in 1941, having spent over five years as a Radio Officer in the merchant marine. I missed my graduation ceremony at TECH because I was immediately posted to a ship after exams and went off to a year's service in Korea.

In the following years, I spent most of my naval time in marine technical work, being involved in ship systems design and construction both in Canada and UK, involving frigates, aircraft carrier and submarines. I was appointed Commodore Superintendent Atlantic Coast HMC Dockyard and served as Base Commander CFB Halifax in the late 1960s. This culminated in being Chief Engineer of the Navy, and



subsequently of the CAF. I retired as Rear Admiral from the position of Associate Assistant Deputy Minister (Materiel) in 1974, joining the Public Service as Director General of Shipbuilding and Heavy Equipment contracting for the Government of Canada.

On retirement from the Public Service in 1979, I worked in marine systems design and construction with several firms in the private sector such as Canadian Vickers, Versatile Systems Engineering, YARD Inc. and VSEL Defence Systems Canada of which I was president of the last three. I finally retired in 1990 at 71 years of age.

I still nostalgically look back on my time at Dal, and TECH, with fond memories, though it was a bit of shock going back to school some 9 years after high school! I remember with particular fondness participation in the Dal Band and the Concert Orchestra, having been an active musician (euphonium and bassoon) for some 12 years at that time

*“Never forget to listen to those that you endeavour to lead, as they more often than not, have more detailed experience in particular problems that may be encountered.”*

(getting my gold “D” on leaving Dal).

They were a great few years, with most of us being vets, and many with families, and a common driving goal to succeed.

Both my wife, now deceased, and I were active sailors all our lives and have only given up this great pastime by selling our last boat three years ago. We were members of the Royal Western Nova Scotia Yacht Club in Digby in the 30's and have been members of the Britannia Yacht Club here in Ottawa for 55 years and remain an Honorary Life Member and Past Commodore.

Over the years I have been active in the Engineering Institute of Canada (EIC), Society of Naval Architects and Marine Engineers (SNAME), Canadian Shipbuilders Association and the Naval Officers Association of Canada, serving terms as President of the Ottawa Chapters of those Associations.

I now live in Nepean, ON near my family of three children, six grandchildren and nine great grandchildren.

– W.B.(Bill) Christie R/Adm. RCN (Ret)

Wide Area Positioning System (WAPS). He sends well wishes to his former classmates who managed to live and work in the Maritimes!

## 1990's

**Geoff Moore, BEng'97 (TUNS industrial)**, has been appointed Director Network Operations of Bell Aliant in Halifax. In his new role Geoff is responsible for the day-to-day operation of Bell Aliant's core network in Atlantic Canada

**Dr. Pongsan Twinprawate, PhD'92 (TUNS mechanical)**, is currently a Rear Admiral in the Royal Thai Navy. Dr. Twinprawate is also an associate professor at the International Maritime College Kasetsart University, in Thailand.

## 2000's

**James Upshall, BEng'01 (mining)** is currently working for an Australian company called Oil Search. James is the drilling superintendent for an oil exploration project in Northern Iraq, and has worked in the international oil and gas business most of his career. In the last 5

years he has worked on projects in Yemen and Libya.



**Ishpreet Minhas, BEng'11 (electrical)**, and **Neha Anand, BEng'09 (electrical)** met at Saint Mary's University in 2006 where they obtained their Diplomas in Engineering. They completed their bachelor degrees at Dal Engineering. Slowly their friendship turned into a relationship and the two were married on July 13, 2013. Ishpreet is working in the oil and gas industry and Neha is working on her master's in RF and antenna design.

**Sir John Houghton CBE FRS**, received a Doctor of Laws, *honoris causa* in 2010 from Dalhousie University, for his work in

the Physics of the Atmosphere and Climate. His autobiography, *In the Eye of the Storm* was recently published in the UK by Lion Publishing. In the book, John describes how advances in computing and satellite-mounted instruments have led to revolutionary developments in meteorology and climate science. The book also discusses his involvement in the IPCC, awarded the 2006 Nobel Peace Prize for its work informing the world of the impacts of human induced climate change.

**Slim Ben Ghalba, BEng'06 (electrical)**, had a few job interviews before graduation – all of which were impressed with the Dal Engineering curriculum. He received three job offers, and was hired before graduating. Slim is now working for Ericsson doing DSP and digital communications, and he credits Dal Engineering for setting him up for success.

## Did you graduate in 1964, 1974, 1984, or 2004?

### Celebrate this important milestone year!

To organize a reunion for your graduating class contact Terri Mann, Alumni Events by emailing [terri.mann@dal.ca](mailto:terri.mann@dal.ca) or by calling 902.494.1378



## KEEP IN TOUCH

**We welcome news and updates from our alumni around the world, and would love to hear from you!**

Class notes and updates may include: marriage, in memoriam and birth announcements, career advancement, relocation, awards and much more. Please be sure to submit your year of graduation and discipline.

Class notes can be sent to [media.engineering@dal.ca](mailto:media.engineering@dal.ca). Alternatively, you may submit via class notes on the alumni website [alumni.dal.ca/class-notes](http://alumni.dal.ca/class-notes)

Thanks to our presenting sponsors:



NSTC · TUNS · DAL ENG

Thank you to sponsors and participants of the Fifth Annual

# Engineering Golf Tournament

And a special thank you to our Hole-in-One Sponsors



Albatross Sponsor: Ericsson



Co-hosted by **Sheldon MacDonald**, BEng'83, (Electrical) and **Len White**, BEng'75, (Civil)



Return undeliverable Canadian addresses to:  
Alumni & Donor Relations Office  
Faculty of Engineering  
Suite 108, Morroy Building, 5269 Morris Street  
PO BOX 15000  
Halifax, NS B3H 4R2

