

# Queen's

ALUMNI REVIEW

Issue 3, 2017

The magazine of  
Queen's University  
Kingston, Ontario

[queensu.ca/alumnireview](http://queensu.ca/alumnireview)

---

Power disruptors

---

Consider the  
fruit fly

---

Who's driving?

---

# Science

on a small scale



# Be a TRICOLOUR TRAVELLER in 2018

Visit [queensu.ca/alumni](http://queensu.ca/alumni)  
click on **Services & Benefits/  
Alumni Travel**



**ALUMNI EDUCATIONAL TRAVEL**  
*experience...beyond the ordinary!*

Request your copy of the 2018  
Alumni Educational Travel catalogue today!  
1.800.267.7837 [travel@queensu.ca](mailto:travel@queensu.ca)

Featuring



**Go Ahead**



2  
Editor's notebook

3  
Letters to the editor

6  
From the principal

7  
*Quid novi*  
News from campus

26  
Keeping in touch

44  
*Ex libris* New books  
from faculty and alumni



9

COVER STORY

## Science on a small scale

With help from NanoFabrication Kingston, researchers are making technology smaller, faster, and better.

*Left, a researcher at work in NanoFabrication Kingston's photolithography room. The orange glass in this "clean room" protects photo-sensitive materials from uv/blue spectrum light.*

BERNARD CLARK

PHOTO ESSAY

## Consider the fruit fly

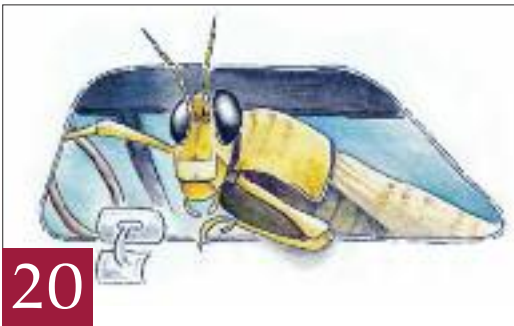
Researchers in the Department of Biology utilize the lowly fruit fly to study evolution, genetics, and neurobiology.

*Seen here, Adam Chippindale, Professor of Evolutionary Genetics, in his main fly lab in the Biosciences Complex.*



15

BERNARD CLARK



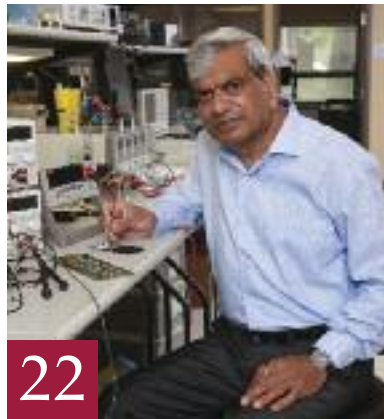
20

CHRISTINE JAMIESON, RGD

FEATURE STORY

## Who's driving?

Jeff Dawson, PhD'01, created a locust-driven car to teach his students about neural-machine interfacing.



22

BERNARD CLARK

FEATURE STORY

## Power disruptors

Praveen Jain and his colleagues at ePOWER are developing tiny micro-inverters that convert sunlight into electricity.

ON THE COVER

Cover design: Figurines created by Christine Jamieson, Jessica Van Dusen, and Andrea Gunn.

PHOTO: BERNARD CLARK



## On paper, plastic, and apps



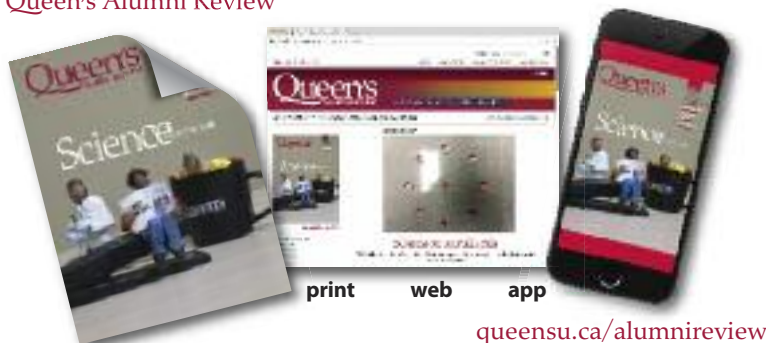
BERNARD CLARK

I received a couple of queries about the packaging of the last issue. A few (but not all) of our Canadian recipients received the last *Review* bundled with an insert from one of our campus or external partners. The combined mailing necessitated the use of plastic wrappers. I'd like to assure our readers that we use extra packaging selectively and choose plastic wrap that is not only recyclable but also bio-degradable. Thank you to **Wayne White**, Arts'64, who wrote to us by mail, and **@McKGuyver**, who queried us on Twitter.

In this issue, we're bundling in the *Q-Chem Chronicles* for our chemistry grads. Our November issue will include a communiqué from the Faculty of Law.

Many of our readers enjoy reading the magazine in print. We like it too! Let me reassure you, the print version of the *Review* isn't going anywhere. But others prefer to read the magazine online, either for environmental reasons or for convenience. So, in addition to the online version of the magazine (which is also AODA-compliant for screen readers and other adaptive technologies), we've launched the *Queen's Alumni Review* app. It provides the complete print magazine experience easily downloadable to your tablet or phone. Check it out in your Android/Apple app store. If you prefer it, let us know if you want us to discontinue your print subscription.

### Queen's Alumni Review



### The international experience

In the next issue, I hope to feature stories of student exchange at Queen's. If you had a transformational experience while at Queen's, either as an international student on campus or as a Canadian student studying abroad, email me: [review@queensu.ca](mailto:review@queensu.ca). Your story may be featured in the November issue.

### Connecting with readers

I hope to meet some of you who are returning to campus for Homecoming activities. I'll be attending the Faculty of Law's 60th anniversary dinner on Sept. 9. And I'll have a *Review* table set up in Grant Hall for Homecoming weekend (Oct. 13–15). If you're ever on campus at another time of year, please feel free to visit me in my new office in Queen's Marketing, fourth floor, Fleming Hall, Stewart-Pollock wing. The *Review's* mailing address (99 University Ave., Queen's University) remains the same.

Andrea Gunn  
Editor  
[review@queensu.ca](mailto:review@queensu.ca)  
613.533.6000 ext. 77016



Queen's  
UNIVERSITY

Volume 91, No. 3, 2017  
[review@queensu.ca](mailto:review@queensu.ca)  
[queensu.ca/alumnireview](http://queensu.ca/alumnireview)  
[@queensureview](https://twitter.com/queensureview)

**Queen's Alumni Review** (circ. 115,000) is published by Queen's University Relations (comprising Communications, Marketing, and Government Relations). Queen's is a member of the Council for the Advancement and Support of Education and the Canadian Council for the Advancement of Education. Subscriptions are free to alumni, \$25 CDN/year for others. Opinions expressed in the *Review* are not necessarily those of Queen's University or of the QUAA.

ISSN #0843-8048

**Queen's University**  
**Principal and Vice-Chancellor**  
Daniel R. Woolf, Artsci'80

**V-P University Relations**  
Michael Fraser

**Executive Director Marketing**  
Helena Debnam

**Editor**  
Andrea Gunn, MPA'07

**Copy Editor**  
Wade Guyitt, Artsci'04, MA'05

**Contributors**  
WRITERS: Mark Witten, Craig Jones, MA'88, PhD'97, Sarah Puschmann  
ILLUSTRATOR: Christine Jamieson, RGD  
PHOTOGRAPHER: Bernard Clark

**Art Director**  
Larry Harris, University Marketing  
**Associate Designer (KIT)**  
Wilma van Wyngaarden

**Advertising/Sponsorship Officer**  
Peter Gillespie, Artsci'01  
Phone: 613.533.6000 ext. 75464  
Email: [advert@queensu.ca](mailto:advert@queensu.ca)

**2016–2018 Queen's University**  
**Alumni Association President**  
Sue Bates, Artsci'91

**Canada Post publications**  
**mail permit #41089017**  
Queen's University  
99 University Avenue  
Kingston, ON K7L 3N6  
Phone: 613.533.6000 ext. 77016

**To update your address or to sign up for the digital magazine, email:**  
[review.updates@queensu.ca](mailto:review.updates@queensu.ca)  
or call 1.800.267.7837  
(toll-free in Canada and U.S.)

Download our app in the Android/Apple app stores.



Queen's University is situated on traditional Anishinaabe and Haudenosaunee Territory.

# letters

## TO THE EDITOR

Here are just a few of the letters we got in response to our technology issue.

### Digital dreams

I was very happy to see the article "Digital dreams: empowering women to code."

I graduated from Queen's in 1979 with a BSc (Honours) in Computing Science and Mathematics. In some classes I took to get my degree, I was the only woman. Funnily, I didn't think that strange.

I was hired immediately out of university as a software engineer, but for many years I was the only woman on a project.

In 1999, I started on my second career as a technical writer. I got that job with little writing experience because I had been a coder/tester and documentation of APIs was pretty much what software people did. I realized, years later, that even at my first job in Toronto in 1980 I was writing user documentation.

I've noticed, through reading the *Queen's Alumni Review*, that until recently the percentage of women in computing was still low, say 5 to 10 per

cent. I wondered why. Now I see that we weren't ready to take our place. We certainly are now!

Thank you again for the article. It was worth the wait.

**Catherine Woods, Artsci'79**

### The techno-ethicist

With autonomous cars for the public and autonomous war machines for the military emerging from development labs around the world, Dr. Millar introduces the problems inherent in having machines make decisions in situations where there is no "right" answer, for example the self-driving car that faces an unavoidable crash but has the choice of hitting a wall, likely injuring or killing passengers, or plowing into a crowd of kids, again with high prospects of injury or death. This question, and others like it, leaves the world of philosophical musing and enters the real world as you or I climb into a car that has no driver and no steering wheel. Are you going to be comfortable with the answer should a situation arise?

Dr. Millar goes on to suggest solutions to



**FOOD FOR THOUGHT...**

Memorable waterfront views, a menu that focuses on the freshest, local ingredients and an award winning culinary team makes AquaTerra your choice for an upcoming dinner, gathering, or event.

 1 Johnson Street, Kingston  
613.549.6243  
aquaterrakingston.com

 **DELTA**  
HOTELS  
MARKET  
KINGSTON WATERFRONT

assuage society's concerns. In the case of the driverless car, he proposes that technological ethicists join product development teams, either as additions to the teams or in the form of engineers well versed in ethics as well as technology. At least it sounds like a solution. It leaves unanswered issues such as who is going to pay the cost of these extra resource and, likely, prolonged development cycles? Engineering teams may have broad creative scope to their work, but it is the management and executives – who will decide what is going to be profitable, provide a good return on investment, etc. – who will ultimately control decisions made, or not. Will ethics rise to the highest priority? It is not clear why it would.

We have an example today, referenced in the article, which has the same allure of ethical input to complex problems, namely informed consent

in medical treatment. The theory is excellent where a well-informed patient participates in the decision process of managing and treating their condition. In practice, many doctors simply produce a list of options for the patients and direct them to choose. Whether through lack of skill and understanding on the part of the doctor, or perhaps encouraged by legal advice to avoid malpractice suits, the reality of informed consent often falls far short of its ideal.

Simply put: translating and integrating high-minded ethical considerations into

our complex world is a monumental task, far exceeding the effort to create the theory in the first place. An analogy would be climate change, an established fact, and its denial or minimization by some of the most powerful people in the world. This article has barely dipped a toe in the sea of issues that technology is presenting today, and which will be a veritable tsunami tomorrow.

**David Kister, Sc'69**

## The IBM 360

I chuckled when I saw the photo of the IBM 360. Fond (and not so fond) memories of walking to Dupuis Hall with boxes of punch cards to have them processed, and then having to wait a few/several hours to obtain the print-out (for which you had to walk back to Dupuis Hall to retrieve). Two years ago I was invited to make a



presentation in Banff at the Campus Alberta Student Conference on Health (a student-organized event by and for graduate and senior undergraduate students training in community health sciences and public health in Alberta) about mentors who had influenced my decision to work in public health in Canada and overseas. One of my mentor stories was about Dr. Roly Tinline of the Queen's geography department, who taught and mentored me and other grad students to create and use simulation models to examine the spread of disease across geographic space – the “early days” of medical geography. When I mentioned the IBM 360 and punch cards, the students were stunned. They asked: How could anyone do anything with such small computing power and punch cards? It was satisfying for me to share with them that, in fact, we achieved quite a lot with very limited (by today's standards) computer technology and a lot of human input.

**Jim Chauvin, Arts'73, MA'79 (Geography), MSc (UBC), HonFFPH (U.K.)**

## Changing times

Congratulations to the *Review* on its most recent issues. The topics have been progressive and educational without being pedantic. Over the past two years you have tackled such sensitive issues as mental health and cancer and done justice to all of them.

Some time ago I had occasion to read copies of the *Review* from the late '60s and early '70s. In the utterly forgettable words of a cigarette advertisement from that era, “You've come a long way baby!” Keep up the good work and give yourselves a pat on the back.

**Doug Rigby, Arts'70, Law'73**



TINE MODEWEG-HANSEN

## Remembering David Kemp

*David Kemp, former head, Department of Drama, associate dean, Faculty of Education (and co-founder of the Artist in Community Education program), died April 26.*

I have just learned of David Kemp's passing. David filled the room when he entered it. His positive ways inspired and delighted this young McArthur student. He gave us confidence to perform at our highest level and instruction on how to gain such success.

On a personal level, he was one of the first supporters to purchase my sculptures. Early in my career he encouraged me to become an associate teacher – and I did. Now retired after a long teaching career, I realize David was a beacon (to my success). He reminded me to hold the room with positive and creative planning and humour. After all, the classroom is a grand stage and the most important one.

In closing, I would like to mention how much I owe to four Queen's professors: David Kemp, Robin Wood, Peter Harcourt, and Ralph Allen. What a wonderfully fertile ground they provided for the imaginative mind. There is so much cross-pollination with stage, film, and studio arts; so much to be gained. They made the arts come alive. I am forever grateful.

**Brad Johns, Arts'71, Ed'73**

Visual and dramatic arts teacher (retired),  
Carleton Place High School

## Remembering Marion Meyer

*Marion Meyer, retired professor (Sociology), died April 26.*

Our first essay in Sociology 080 was due early in the fall of 1968. In a common beginner's mistake, I explained to my tutor, Marion Meyer, what was wrong with the discipline as a whole. That earned me a D grade, but it caught my attention. Mrs. Meyer was a diminutive, greying woman who spoke with a trace of German accent. She was good-humoured and liked to tease us gently, while disrupting our expectations about the world. She generated lively discussions. We had no inkling of her remarkable life history. We knew nothing about the diaspora of German Jewish intellectual refugees at the New School for Social Research, where she had done her MA. We didn't know that she was a multi-linguist who had been a child prodigy, driven out of Germany and then out of France by the Nazis. She did not speak about such things at all, as far as I can remember. She did comment that my third paper, "On religion and prejudice," was too general, adding "to speak about religion ... about prejudice and

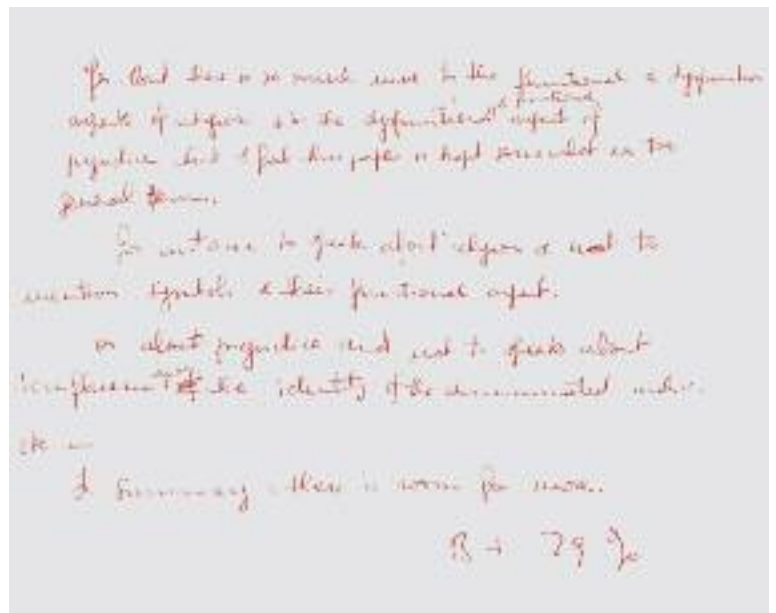
not to speak about its influence upon the identity of the discriminated individ[idual]" was not enough. As she well knew!

Mrs. Meyer showed us how to do sociology. As only a good teacher can, she got us to take critical distance from our own experience by applying sociological concepts to it. We learned about social roles and institutions. We were sent into the community to observe and to use our concepts to analyze a social scene. I spent quite a few evenings drinking coffee in a downtown greasy spoon, watching the owner/waiter at work. Mrs. Meyer wrote on "George: Interaction" "What's George's address? I'd like to meet him" and gave the paper an A. I gobbled up our textbook and aced the final.

Mrs. Meyer became Marion at some point during my degree and I was pleased and honoured by her regard. In 1973–74, as the Sociology "super tutor" at Queen's, I found myself doing the work for beginning students she'd done for me. That work and Marion's example inspired me to seek to teach things with real substance, to promote self-reflection, to combine patience with good humour, to encourage signs of creativity – however unpolished – and to deliver needed wake-up calls judiciously.

**Bruce Curtis, Arts'72 (MA, PhD, U of T), FRCS**

*Dr. Curtis is professor of sociology and history at Carleton University, a member of the Institute of Political Economy, and the author of two award-winning books on historical sociology, The Politics of Population and Ruling by Schooling Quebec. ■*



"In summary, there is room for more." This is one of the comments Bruce Curtis got from Professor Marion Meyer on a sociology paper. He accepted the challenge, finding his own calling in the field of sociology.

# From micro-history to nanotechnology

BY PRINCIPAL DANIEL WOOLF



BERNARD CLARK

Some of you may remember an economics book that became a bestseller in the 1970s, E.F. Schumacher's *Small is Beautiful*. Schumacher's book, and its title, have proved prophetic in ways he couldn't have imagined over 40 years since his death in 1977. "Small" is in fashion in many spheres of activity and inquiry. In my own discipline, history, scholars have long practised an approach known as 'micro-history', seeking an understanding of the past through a detailed, ground-level examination of such things as village life in the 17th century or, even more narrowly, the politics and social assumptions surrounding famous past court cases. Elsewhere in the humanities, art historians and conservators use microscopic means to analyze pieces of art, sometimes to establish authenticity. Linguists study not just languages and texts, but the words, and sounds, that generate both.

The natural sciences have, of course, always been concerned with the small. Chemists and biochemists work with the basic building blocks of matter, atoms and molecules. Microbiologists study viruses and germs. Geneticists focus on the smallest determinant of the shape and structure of life, the gene, both to understand how we work and to identify the genetic causes of diseases and find ways to identify, cure, or eradicate them. Queen's astrophysicists – ostensibly studying the biggest thing of all, the universe and its contents – do so often through analyzing the smallest types of matter, such as the neutrinos studied by our

Particle Astrophysics group. Our computer scientists create ever smaller, and faster, digital processors and even tiny, flexible computers. And our engineers, who also build bridges and roads, set up mines, and construct cities, also now work with the very small, in chemical engineering or engineering chemistry, in electrical and computer engineering, and, increasingly in the emerging area of biomedical engineering where stem cell research connects engineers and medical researchers. Those replacement limbs sported in science fiction by the likes of Luke Skywalker may be closer than that galaxy far, far away; they may be as close as our interdisciplinary Human Mobility Research Centre.

One of the most exciting developments in recent years is nanotechnology, which extends into a wide variety of traditional disciplines. Kingston and Queen's are the joint home of NanoFabrication Kingston, a collaborative venture between the university and CMC Microsystems, profiled in this issue of the *Review*. This facility can build tiny tools for research in engineering, medicine, and physics, and give instruction on how to use them, thereby providing a powerful engine for experiment and innovation. Elsewhere in this issue you'll find a piece on how our researchers use one of the tiniest and most ephemeral of creatures, the fruit fly, in their research.

Innovation, which has been profiled in these pages a number of times over the past several issues, comes in many forms and in many sizes. Some of it is directly applied and quickly commercializable. A great deal of it occurs in fundamental research, which will often end up having applied outcomes that can't be anticipated at the start of an experiment. Our students, faculty, and research staff continue to innovate in the natural and human sciences, and many of them have generated spin-off companies, or socially innovative organizations, out of their work. (Think of CleanSlate UV, which cleans cell phones and tablets of infection-causing germs; or Gryllies, which turns crickets into a high-protein food for impoverished countries – just two examples of student startups emerging from the Dunin-Deshpande Queen's Innovation Centre.) While "small" is indeed beautiful in many contexts, there is nothing small about our university community's imagination or its drive to innovate. ■



# QUID novi? *\*being a compendium of "what's new" on campus*

## The evolution of medical education

The Queen's School of Medicine has adopted the competency-based medical education (CBME) model for medical residents.

The CBME model was created in partnership with the Royal College of Physicians and Surgeons of Canada. Under this model, this year's cohort of about 130 residents will be moved to their next rotation once they have demonstrated competency in the clinical tasks and activities expected of them at each stage. Previously, residents usually moved on once they had completed a certain amount of time in a set rotation. Queen's is the first school in North America to implement CBME across all of its specialty programs.

As an important next step, other

hospital health-care professionals will be able to share their feedback with every resident and their supervisors as part of CBME. The School of Medicine also aims to allow patients and families to contribute to the educational process in the future.

For the residents, this new model promises a rewarding learning experience as they will receive more timely feedback and mentorship from their faculty supervisors and academic advisors. This will help them identify their strengths and weaknesses at every stage. They will also have increased opportunities to pursue personal learning goals and desired areas of excellence.

While the Royal College of Physicians and Surgeons has asked

all Canadian medical schools to transition their specialty residency training programs to the new model by 2022, Queen's opted to transition all 29 residency programs at once. The move caps more than two years of preparatory work, and was led by an executive team of eight faculty and staff members in the School of Medicine.

*The Review will take a closer look at the CBME model in action at Queen's in the next issue.*

*"All the evidence points to using a competency-based approach as the fundamental and logical next step in medical education."*

*– Damon Dagnone, CBME Lead, Queen's University*

### IN MEMORIAM

**Harold Still**, MA'55 (PhD, Virginia), retired professor (Mathematics and Statistics), died Jan. 7.

**Gilbert Rosenberg**, former professor (School of Medicine) and medical director, St. Mary's of the Lake Hospital, died Jan. 12.

**Margaret Hooey**, LLD'02, longtime secretary of the university, died Jan. 13.

**Uri Fixman**, Professor Emeritus (Mathematics), died March 8.

**Barrie Pickles**, former professor and director (Rehabilitation Medicine), died July 7.

**John Freeman**, BA'76, BEd'77, MEd'90, professor (Education), died Aug. 1.

Obituaries for Dr. Hooey and Professor Pickles are posted on the *Review* website: [queensu.ca/alumnireview](http://queensu.ca/alumnireview).

*If you have memories of these individuals you would like to share, please email us at [review@queensu.ca](mailto:review@queensu.ca).*

## QUEEN'S UNIVERSITY ELECTIONS Results of 2017 Elections to University Council by Alumni

**Greg Frankson**  
Whitby, ON

**John Frezell**  
Kitchener, ON

**Anjali Helferty**  
Toronto, ON

**Cathy Matthews**  
Toronto, ON

**Tka Pinnock**  
Toronto, ON

**Kathy Pritchard**  
Toronto, ON

**Julia Reid**  
Brooklyn, NY

**Chu Wang**  
Toronto, ON

**Kate Wilson**  
Cambridge,  
Cambridgeshire  
United Kingdom

**Tom Woodhall**  
Toronto, ON



[queensu.ca/secretariat/elections/university-council](http://queensu.ca/secretariat/elections/university-council)



**Queen's**  
UNIVERSITY



Workers are tearing out stone that has filled these window frames since 1970. New heritage-style glass windows will be installed by December.

## Let there be light

Five large window frames facing Union Street are being opened up for the first time in 47 years as part of construction activities at the Innovation and Wellness Centre (the former Physical Education Centre.)

Modern thermal windows with a heritage look will be installed in the frames by early December, allowing natural light into the new centre.

“The premise of the design is to deliver a building that is open, light, and inviting to all. Therefore, it was a natural direction to open up the main façade,” says Franco Lora, project manager, Physical Plant Services.

The limestone, brick, and block being removed as part of the window work is not going to waste. All of the stone will be used to stabilize and repair the degraded areas of the existing south façade. The demolition work should be complete within the next couple of weeks.

Crews are working to enclose the Innovation and Wellness Centre construction site by the end of the year, with all construction activities set to be complete in time for a fall 2018 opening.

## The Page Lectures

October 24

The annual Page Lectures series, hosted by the Queen’s Department of English Language and Literature, honours the late Kingston writer and artist Joanne Page. Each year, a distinguished writer is invited to give a lecture on the subject of “the page.” This year, the series welcomes acclaimed poet Daphne Marlatt, whose talk is called “On the Threshold of the Page.” Watson Hall, Room 517, 2:30-4:30 pm. [www.facebook.com/PageLecture/](http://www.facebook.com/PageLecture/)

## QL@60

The Queen’s Faculty of Law celebrates its 60th anniversary this September. In recognition of this milestone, Queen’s Law hosts a special Homecoming weekend on Sept. 8–10. Learn more: [law.queensu.ca](http://law.queensu.ca).

## The magazine of Queen’s University since 1927



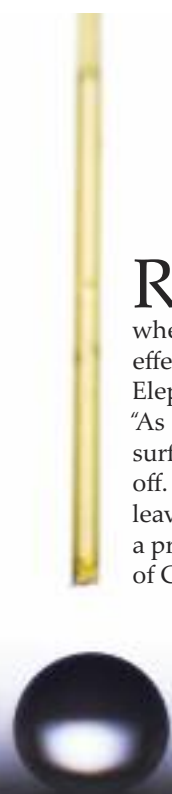
Support the *Queen’s Alumni Review*:  
[givetoqueens.ca/magazine](http://givetoqueens.ca/magazine)

**Queen’s**  
 ALUMNI REVIEW

# Science on a small scale

*With help from  
NanoFabrication  
Kingston, researchers  
are making technology  
smaller, faster, and better.*

BY MARK WITTEN



Richard Oleschuk was watering the plants in his garden when he noticed an unusual effect upon dousing the large Elephant Ear (*Colocasia*) plants. "As soon as the water hit the surface of the leaves, it rolled off. You could never make the leaves wet," says Dr. Oleschuk, a professor in the Department of Chemistry.

*A drop of water sits on a superhydrophobic surface.  
This photo by Timothy Hutama, a master's student in the  
Oleschuk lab in the Department of Chemistry, received honourable  
mention in the Queen's 2016 Art of Research photo contest.*

Intrigued by the plant's water-repelling properties, Dr. Oleschuk brought leaves to his lab for further investigation. He asked graduate student Lili Mats (now PhD'16) to analyze the micro- and nanostructural features of the *Colocasia* leaf with a scanning electron microscope to learn more about how it repels water. "She looked at me like I had three heads," he says.

They soon learned that the leaf had a superhydrophobic surface, with a high water-contact angle of  $150^\circ$  (much greater than water-repelling Teflon<sup>®</sup> at  $115^\circ$ ) and a low roll-off angle, which measures the ability of a surface to shed a droplet. These surface features provide very low frictional resistance, so water droplets can move easily across the surface with minimal applied force. "The *Colocasia* leaf really dislikes water. Certain plant species have evolved superhydrophobic, self-cleaning leaves that shed water, dust, and debris following a rain to maintain a high photosynthetic efficiency," explains Dr. Oleschuk.

### On-the-spot diagnostics

Inspired by this chance observation of a natural superhydrophobic surface, he began a series of experiments that led to the development of laser-patterned microfluidic chips with different wetting properties that could be used to perform on-the-spot diagnostic tests for plant viruses and bacteria, water quality, or infections and other diseases in humans.

Microfluidics is the science of manipulating fluids at the micron scale (one-millionth of a metre). It involves making tiny little channels of flowing liquids on a chip, and being able to do chemistry or biology on tiny volumes using very sensitive detectors all fabricated on a chip.

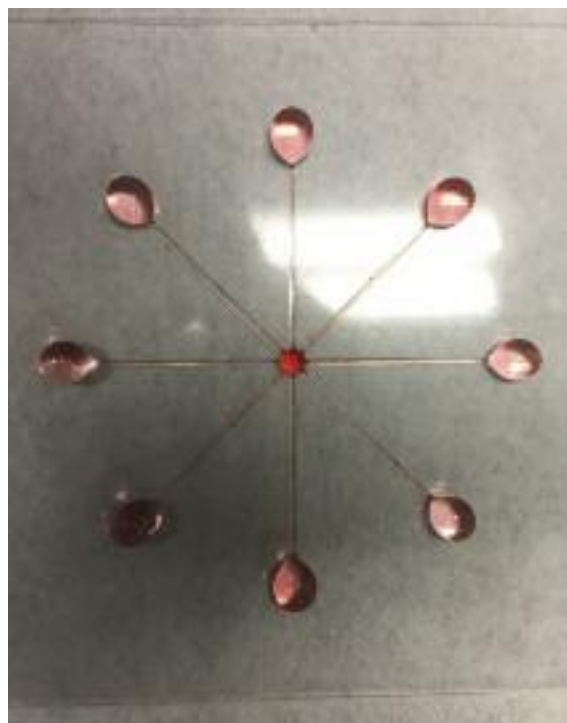
In the initial experiment, Dr. Oleschuk tried using a bar magnet to move and direct water droplets less than one nanolitre in volume (a nanolitre is one-billionth of a litre) on the water-repellant leaf surface attached to a glass microscope slide. He then identified a commercially available superhydrophobic coating based on fluorinated silica nanoparticles, applied the coating to a glass slide, and found that the magnet moved the droplets at a much higher velocity on the coated surface than on the leaves.

Dr. Oleschuk and his team of grad students then built a microfluidic chip with alternating hydrophilic (water-attracting) and superhydrophobic (water-repelling) areas. Using the Oxford Lasers laser micromachining system at Nano-Fabrication Kingston, they burned off the water-repellant coating on certain areas of the glass slide to create a pattern of circular, water-attracting channels of different sizes on the glass substrate. Nano-sized water droplets were deposited on the

channels and fluorescence-based chemical analyses were performed on the chip. "The glass surface loves water and is very wetting. Certain areas can't get wet and others can, so the droplets travel on the water-loving channels. You can then conduct different tests on each channel on the chip," he says.

Their new method of manipulating and analyzing minute sample concentrations on a chip (recently published in the American Chemical Society journal *Applied Materials and Interfaces*) is a promising advance in the emerging field of droplet-based microfluidics. It's a fast, easy, and inexpensive way to do chemical analyses or biological tests on a drop of blood, saliva, serum, or urine. It has many advantages over current methods of chemical and biological testing, which can be expensive and cumbersome, requiring complicated instruments, large amounts of sample, and long processing times. Using fewer reagents for chemical analyses also reduces the environmental impact. "The star-shaped, portable device we designed and fabricated allows you to conduct a very large number of tests in a short period of time. You can do five or six different tests on a single device and it takes 30 seconds to get a result," Dr. Oleschuk says.

He is now collaborating with Ephyra



This star-shaped device pumps liquids from the central hub toward the outer edges using Laplace pressure. It can be used to conduct multiple tests simultaneously on a single drop of fluid. The star device was laser micromachined at NFK.

KYLE BACHUS

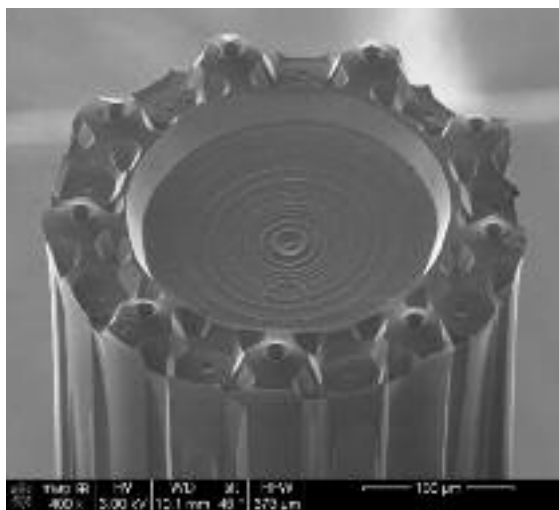
Biosciences, a company that sells antibody tests to detect plant pathogens in fruits and vegetables – to develop easy tests to characterize plant disease in potato as well as beer bacteria contamination. The “potato chip,” for example, would use a superhydrophobic/hydrophilic approach and incorporate antibodies specific to the plant pathogens that growers want to test to help improve crop yields. “It’s personalized medicine for the potato plant. The ‘potato chip’ could do rapid, on-the-spot tests for specific viruses and the result could guide the grower in treating the crop in a certain way,” Dr. Oleschuk says.

### Creating a map for surgeons

He is also working with cancer researcher David Berman, director of the Queen’s Cancer Research Institute, to develop tools that use superhydrophobic/hydrophilic materials and incorporate antibodies for imaging of tumours. One imaging application might be to aid in biochemical mapping of the regions within and around a tumour to narrow the margins for surgical removal. A more accurate, detailed map of the tumour could allow the surgeon to be more precise in removing cancerous tissue, while leaving more healthy tissue intact. “Without the laser micromachining capabilities of the NFK facility, none of this work would have happened,” says Dr. Oleschuk.

In another line of nanotechnology research, Dr. Oleschuk has developed and patented a microfluidic shower head with nine microfabricated nozzles that can efficiently generate and spray nanometre-sized droplets into spectrometers capable of analyzing chemical compounds and human disease biomarkers. This next-generation, nanoelectrospray emitter, developed in collaboration with Université Laval researchers, is much more sensitive and less likely to clog than current devices and could lead to improved detection of diseases such as cancer. “We are making shower heads smaller than a human hair-width using ultra-fine glass tubes. These devices are cost-effective and you can do tests with more sensitivity and much faster than with the current technology,” he says.

In 2016, Dr. Oleschuk and the Laval researchers formed a partnership with Trajan Scientific and Medical in Australia, which licensed the patent, to develop and commercialize the next generation of devices and components to enhance the sensitivity of electrospray mass spectrometry. Funding from CMC Microsystems and an NSERC grant in the early stages of development were helpful in attracting an industrial research partner to commercialize the technology. “Doing research for general interest and contributing to background scientific knowledge are important. But if you can



KYLE BACHUS

*This microfluidic shower head, patented by Dr. Oleschuk, could lead to improved detection of disease.*

create a device that has an impact and get the device to the stage that it is commercializable, that’s very satisfying,” he says.

The creation of laser-patterned microfluidic chips is just one example of the kind of cutting-edge research carried out at NanoFabrication Kingston (NFK), an \$8-million lab established at Innovation Park in 2015 as a partnership between Queen’s and CMC Microsystems. NFK is an open-access lab that offers access to leading-edge equipment, methodology, and expertise for designing and prototyping microsystems and nanotechnologies. It’s funded through the Canada Foundation for Innovation and the Ontario Ministry of Research and Innovation, as well as Queen’s and CMC.

*“We are making shower heads smaller than a human hair-width.”*

### A machine shop for research innovation

“This is like a modern machine shop for making things on a tiny scale. We help solve problems, whether it’s with tools and equipment or the expertise of people here, through CMC, or other partners on campus and across Canada,” says Rob Knobel, a Queen’s physics professor and lead researcher at NFK.

The facility enables individuals and companies to explore new frontiers in the design, creation, and testing of innovations on the scale of the nanometre, one-billionth of a metre or one-thousandth of a micron. (Microtechnology is on the scale of a micrometre or micron, one-millionth of a metre.) “The difference in this lab is on the scale of what we can make. In nanotechnology, you’re talking about being able to place one or a few atoms or molecules where you want them. You can even manipulate atoms one by one for a

During a 2016 tour of the NFK facility, Graham Gibson presented Ontario Premier Kathleen Wynne with a tiny plate etched with the logos of Queen's University and CMC Microsystems to thank the Ontario government for its contribution to the lab. The plate was created through laser ablation, in which the material absorbs the laser energy and vaporizes. The short pulse length of the laser allows for high-precision machining with well-defined edges. The process can be used on plastics, metals, and even paper.

Another example can be seen at right. Principal Woolf's column, "From micro-history to nanotechnology," has been replicated on a 2 cm-square piece of gold-plated metal.



BERNARD CLARK



BERNARD CLARK

few materials, controlling and measuring them," says Dr. Knobel.

### Why can't we make them small?

Richard Feynman, the famous American physicist, is credited with proposing the concept of nanotechnology at a 1959 lecture in which he said:

*I don't know how to do this on a small scale in a practical way, but I do know that computing machines are very large; they fill rooms. Why can't we make them very small, make them of very little wires, little elements – and by little, I mean little. For instance, the wires should be 10 or 100 atoms in diameter ... There is nothing I can see in the physical laws that say the computer elements cannot be made enormously smaller than they are now."*

But it took some time for people to work on it, first in microelectronics and later in chemistry, physics, and other fields. Today, nanotechnology is emerging as the go-to field for new innovations with the potential to improve dramatically the speed, performance, and cost of almost any device you can imagine.

Dr. Knobel's own research focuses on nano-electronics and nano-mechanics, making tiny moveable objects with the extreme sensitivity needed to measure quantum effects. Using the techniques of lithography, etching, and deposition, he fabricates nanometre-scale structures that can move. In one project, he and his students are building tiny vibrating sensors made from graphene, a form of carbon a single atom thick. Only a few molecules absorbed on the membrane will change its vibration, potentially enabling vapour sensors. "We're developing graphene chemical sensors with the goal of detecting vapours in parts per billion or trillion concentrations. These could be used for detecting explosives or biological agents," says Dr. Knobel.

The NFK facility houses state-of-the-art tools

for fabricating and prototyping new nano-scale inventions. There is specialized equipment for picosecond laser micromachining, electron beam evaporation, plasma etching, and scanning electron microscopy. Earlier this year, the lab added three pieces of new equipment for deposition, patterning, and etching of materials with greater ease, speed, and precision. "With our deposition tool, you can deposit less than a nanometre of material on a surface," explains Graham Gibson, NFK lab operations manager and CMC employee, who trains users in nanofabrication techniques for their specific applications. "We enable a lot of research. We help users with our tools and expertise, and then they will often do the fabrication themselves here. We help them create the device, and then they go away and use it."

### Design. Make. Test.

NFK offers special learning advantages for students too. "The design-make-test cycle is greatly accelerated with this equipment. My students can design a prototype in the morning, fabricate it in the afternoon, and test it that evening. They learn a lot from the hands-on experience of making the product themselves rather than having to send it off to be made somewhere else," says Dr. Oleschuk.

Hannah Dies used NFK's maskless lithographic system to create a chip with a novel metallic nanosubstrate that can detect a wide range of substances. "I was one of the first users of NFK in 2015. The lithographic system gives you lots of flexibility in how you design the chip. I worked very closely with Dr. Gibson to learn how to do this and now it's quite routine to go in and make my chips," says Ms. Dies, who is pursuing a combined PhD in chemical engineering and MD from the School of Medicine.

A key to her device's exceptional sensitivity is its tree-shaped nanostructure surface, a series of extended and interconnected dendritic nanoparticles that amplify signals from attached electrodes on the chip. "We built the device from the bottom up. We didn't originally expect this to have the shape that it did, a dendritic, branched nanostructure. It looks like a little nanoforest of trees. The theory is that creating branches allows for greater amplification and also extends the area available for sensing," says Ms. Dies.

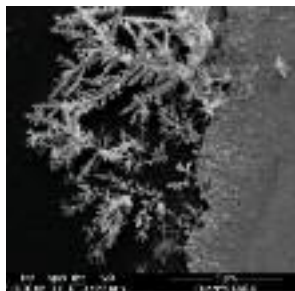
## A chemistry lab on a chip

She built into the chip the capacity to use a powerful technique called SERS (surface-enhanced Raman scattering), which can provide highly sensitive detection of chemical and biological substances at low concentrations. "Conventional SERS substrates require expensive pieces of equipment and take time to produce. Our SERS-on-a-chip substrates can be fabricated in only a few minutes and are simple to use."

Ms. Dies was the primary author of a recent paper (published in the Royal Society of Chemistry's *Nanoscale* journal) that showed how well this point-of-use fabrication method works. Her PhD supervisors, Aris Docoslis and Carlos Escobedo (Chemical Engineering), were co-authors, as was PhD student Joshua Raveendran. As proof of concept, the study demonstrated that their SERS-on-a-chip device could detect melamine in infant formula at 1 part per million (ppm), well below the World Health Organization's safe allowable concentration of 2.5 ppm. The researchers spiked apple juice with thiram, a pesticide toxic to the liver. The chip detected thiram at 1 ppm, seven times below the prescribed maximum residue limit. Cocaine was detected in distilled water (saliva is 99.5 per cent water) at concentrations below federal workplace testing limits.

Ms. Dies followed this up with an experiment showing the SERS-on-a-chip sensor could do very specific tests to detect multiple illicit drugs from saliva samples: "We have promising results about the identification of specific illicit drugs and the ability to differentiate one from the other. We tested cocaine, THC, heroin, and OxyContin and found we can successfully run tests on all four."

She sees commercial opportunities for this nano-sensing technology in fields such as food safety, drug screening, and hazardous materials testing. The researchers are filing for a patent and a team of students from the Queen's Innovation Centre Summer Initiative – a boot camp for budding student entrepreneurs – is working on business strategies to develop and market the technology. "They are a super-competent, energetic group of students looking at all aspects of developing and commercializing this technology. It's cool to be able to stay in science but have a team support the business side of



things. You need that to have an impact with your research. A lot of great scientific ideas would stay in the lab without it," she says.

When Ms. Dies arrived at Queen's in 2014 and spoke with Dr. Docoslis, a nanomaterials expert, about possible research projects, he took her down the hall to chat with Dr. Escobedo, a biosensor technology expert. They needed a graduate student to assist with their project on microfluidic devices as portable biochemical sensors and they saw her background in physics as an asset. Although the fields of chemical- and bio-sensing were new to her, she was up for the challenge. "It's fun to get addicted to a project that has a lot of different aspects to it," says Ms. Dies, who earned a prestigious Vanier Doctoral Scholarship in 2015 for her early work on the project.

Now that she has created a portable sensing device to detect food contaminants and illicit drugs, the future doctor wants to further develop the technology for medical applications. After completing her second year of medical school, Ms. Dies plans to tackle this as a research project next summer: "Medical diagnostics are more challenging. My goal would be to look at a biomarker of cancer and see if we can modify our sensor by adding in some bioselectivity, so it can detect a complex disease biomarker at low concentrations. That's my dream project. And because nanotechnology is an emerging field, there is a lot of room for discovery." ■

Learn more about NFK: [nanofabkingston.ca](http://nanofabkingston.ca).

Left, detail of the "nanoforest of trees" on Hannah Dies' lab-on-a-chip. The line at the bottom labelled 5µm is 5 microns long, or the size of a dust particle.

Below, Hannah Dies at work at NFK.



MATT MILLS




# 2017 GAELS FOOTBALL TICKETS ON SALE NOW

## HOME OPENER

<p>QUEEN'S VS. CARLETON</p>  <p>AUG. 26 1PM</p>	<p>QUEEN'S @ OTTAWA</p>  <p>SEPT. 4 1PM</p>	<p>QUEEN'S VS. LAURIER</p>  <p>SEPT. 16 1PM</p>	<p>QUEEN'S @ WESTERN</p>  <p>SEPT. 23 7PM</p>
<p>QUEEN'S @ WINDSOR</p>  <p>SEPT. 30 1PM</p>	<p>QUEEN'S VS. WATERLOO</p>  <p>OCT. 5 6:30PM</p>	<p>QUEEN'S VS. YORK</p>  <p>OCT. 14 1PM</p>	<p>QUEEN'S @ TORONTO</p>  <p>OCT. 21 1PM</p>

## HOMECOMING

 = GAMES PLAYED AT RICHARDSON STADIUM

CAN'T ATTEND THE GAME IN PERSON? WATCH LIVE ON



**#9** CHRIS OSEI-KUSI  
RECEIVER  
ARTS

[GOGAELSGO.COM/TICKETS](http://GOGAELSGO.COM/TICKETS)





# Consider the fruit fly

BY ANDREA GUNN

Of what possible use is a fruit fly? Besides, of course, letting you know that those bananas in your kitchen have gone off. The fruit fly, or *Drosophila* (“Dew-lover” in Greek), is attracted to the yeasts in rotting fruit and in wine. For many, it is seen as a harmless annoyance. But for more than a century, the fruit fly has been a central player in the study of genetics. With its large chromosomes, rapid life cycle, and ready supply, *Drosophila melanogaster* has made a perfect model organism for study by scientists. *Drosophila* was first studied for genetic purposes in the 1880s by entomologist Charles W. Woodworth. In the early 1900s, Thomas Hunt Morgan, a biologist and geneticist, demonstrated, through his work with fruit flies, that genes are carried on chromosomes and are the mechanical basis of heredity. By 2000, the *Drosophila* genome had been fully sequenced.

“The fruit fly nervous system is very sophisticated,” says neurobiologist Mel Robertson, “and its brain is accessible to study by some very detailed techniques. You can do things with flies that you can’t do with a more complex nervous system. With the fly, because of its very fast reproduction and accessible genome, it is easier to do genetic manipulations. The genetic techniques for targeting specific tissues, and even specific neurons in the brain, and manipulating them, it’s amazing. If you say, ‘I’d like to do such-and-such elaborate experiment,’ probably you can do it on a fly.”

*A light micrograph of a fruit fly.*

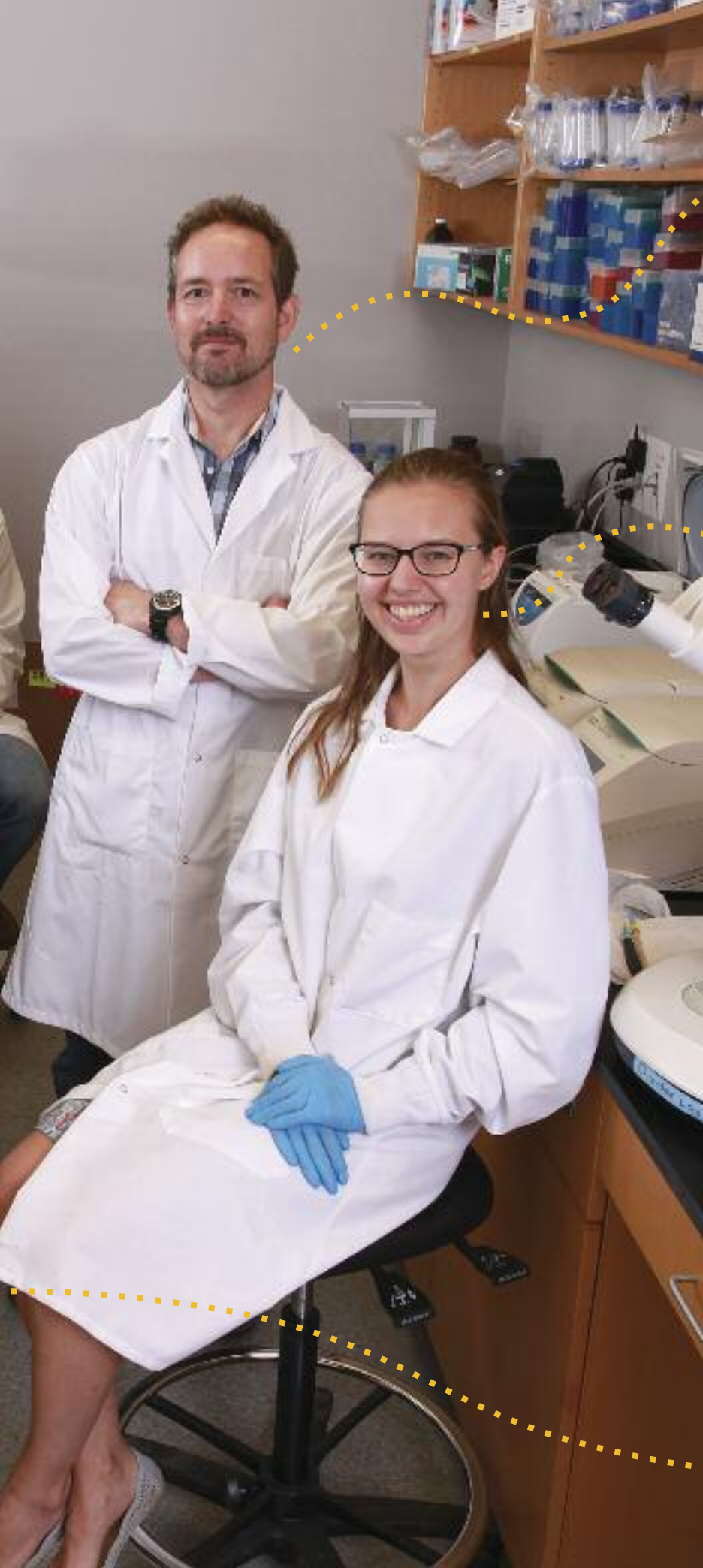
Adam Chippindale and his students study evolution in real time. “We do experimental evolution,” says Dr. Chippindale. “We have an artificial phylogeny – a tree of life – that we’ve created from common ancestry, with some that have been selected to reproduce at late ages, some at young ages, and some at *extremely* early ages. We have pushed them right to the speed limit of development.” Dr. Chippindale developed his line of early-developing fruit flies as a grad student at UC Irvine, studying with Michael Rose (Artsci’75, MSc’76, PhD, Sussex), a noted evolutionary biologist. Dr. Chippindale’s strain of fast developers has now gone through more than 1150 generations of evolution.

**Josh Alpern**, PhD student. Mr. Alpern is looking at fine-scale aspects of gene expression through growth, i.e., what genes are being turned on at which stages during larval growth. “I’m interested in evolution as a repeatable process. I’m looking for patterns, using the system that we have, to see if they have evolved the same way. If they have evolved in the same way, then the process is repeatable. If the process is repeatable, it can potentially be predictable.”

**Mansuba Rana**, BSc student. Ms. Rana is working in the lab this summer through the Queen’s Summer Work Experience Program. “I’m working on a new method of sperm count of the fast and slow-developing fruit flies, studying flies that have GFP in their semen.” [*GFP – that’s Green Fluorescent Protein – is used by scientists to study, among other things, reproduction in living model organisms.*]

**M.K. Hickox**, BSc student. Ms. Hickox is working in the Chippindale lab this summer through the NSRC Undergraduate Student Research Award program. “We know that speciation is a widely occurring phenomenon. We’re hoping through our experiment that we’ll get a better understanding of when exactly it occurs. We’re studying it through reproduction and selection.” [*Speciation is the evolution of two or more distinct species from one lineage.*]





■ **Adam Chippindale**, Professor of Evolutionary Genetics. “Nature rarely offers us the opportunity of statistical replication. In the lab, we can take one population and make it evolve to be reproductive at late ages, take another and make it competent to reproduce at early ages. We can take five or six of each type, and so we can have different origins from different populations in nature. Then we can ask, ‘How repeatable is the evolutionary process?’ Because we can independently employ the same conditions in different lines and ask, ‘Do they change in a parallel fashion? Do they converge together in the same kind of organism in the end?’”

■ **Anastasia Shavrova**, MSc student. “I’m putting our two fruit fly lines, the very fast and the slower developers, under extreme environments. As we would predict, the ones that develop faster will get out of that environment a lot faster. I’m also looking at what that causes at the adult stages: can they find a mate successfully? Can they lay as many eggs successfully after being in an extreme, crowded environment?”

### The power of the model organism

“In an ecologically simplified setting, we can strip away the complexity of seasonal change, of migration, and environments,” says Dr. Chippindale, “... all of the fluctuating factors that cause populations, as we know now, to evolve incredibly rapidly, but back and forth all the time. If this year is dry, then drought-tolerant individuals will survive and get selection moving in that direction, but then if we have a couple of years when it is wet, those individuals may be at a selective disadvantage, and selection goes the other way. We know that organisms evolve all the time but they don’t always evolve in the same direction for a long time. But we can, in a lab, take away a lot of that complexity and observe selection in the same direction for a long time.”



Geneticist Virginia Walker explores stress genes and the molecular basis for resistance. She has used fruit flies to study everything from human birth defects to gut health.

A few years ago, Dr. Walker learned, from a student, about a brand of washing machine that incorporated silver nanoparticles into its wash cycle. The nanoparticles dropped into the laundry water killed the bacteria in the dirty clothes, keeping clothes cleaner for longer.

Dr. Walker wondered, "What happens to the laundry water when it was dumped out into the environment? What does it do to all the soil microorganisms? And what does it do to invertebrates?"

Dr. Walker and her colleagues studied the effect of the particles both on soil and on fruit flies. They found that in the soil, silver nanoparticles killed off specific beneficial bacteria. And it had a dramatic effect on the development of fruit flies, killing many off before adulthood. "The few surviving adults themselves were very pale, without their usual stripes. They didn't have as much energy. They were

reminiscent of the fruit flies I had grown axenically, without bacteria. So I thought, maybe the impact of the nanoparticles was on the fruit fly microbiome – their gut bacteria. I dissected the guts of fruit flies and extracted and sequenced their DNA. I saw that the distribution of the microbes in their guts had completely changed. It had gone from a very diverse community to one that was not so diverse."

Dr. Walker, with (then undergraduate student) Eric Saulnier, Artsci'15, and post-doctoral fellow Pranab Das, followed up these observations by looking at the effect of silver nanoparticles on the human gut, with University of Guelph professor Emma Allen-Vercoe. They found that the addition of minute amounts of antibiotics to silver nanoparticles killed off susceptible bacteria. While this needs further study, Dr. Walker says, "This may be a way of reducing antibiotic resistance. What I think is happening is that the silver nanoparticles may essentially be disrupting the membrane of the microbes and allowing sub-clinical doses of the antibiotic to go in and kill them."

*Virginia Walker in her office. On the wall behind Dr. Walker, besides her many teaching awards, is an insect-themed print created for her by Melissa Mazar, BFA'95.*





BERNARD CLARK

*Shuang Qiu, Parn Srithiphaphirom, and Mel Robertson with samples of *Drosophila melanogaster*.*

In his lab, Dr. Robertson and his graduate students study how nervous systems cope with environmental stress. “We’re interested in the response of the nervous system to various stressors,” he says. “High temperatures, low temperatures, low oxygen. For insects, these are environmental stressors that they have to cope with, but we can use these as models for human pathology. For high temperature, think ‘fever,’ for low oxygen and low glucose, think ‘stroke.’ At the level of single neurons and the molecular properties of neurons, there is a great deal of similarity between insect neurons and human neurons. They work pretty much the same way.”

Dr. Robertson’s lab has been the site for a number of research projects on both locusts and fruit flies that have promising leads for treatment in humans for stroke, epilepsy, and migraines. Gary Armstrong, who completed his PhD in 2009, received a Governor General’s Academic Gold Medal for his PhD thesis on cellular signalling pathways of the locust. His research examined the consequences of oxygen deprivation and similar phenomena related to the events that occur in the brain after stroke. (Now a professor at the Montreal Neurological Institute at McGill University, Dr.

Armstrong continues his study of brain diseases, focusing now on ALS.)

Shuang Qiu, who recently defended her PhD thesis, studied the locomotor performance of fruit flies. She examined various effects, from age to long-term environmental effects to hypoxia, on the performance of fruit flies. She is also excited about the possibilities of *Drosophila* research to lead to medical advances in stroke prevention and treatment.

Parn Srithiphaphirom, a first-year doctoral student, is studying chill coma and neural function in locusts. But she is also exploring her options and has picked up some pointers on working with fruit flies from Dr. Qiu before she leaves Kingston. Dr. Qiu, who recently welcomed her second child, has accepted a faculty position at Nanjing University of Science and Technology. ■





CHRISTINE JAMIESON, RGD

# Who's driving?

*Jeff Dawson, PhD'01, created a locust-driven car to teach students about neural-machine interfacing.*

BY SARAH PUSCHMANN

The first time Jeff Dawson showed off his newly built miniature car in action, he got a big reaction from his audience. After all, it wasn't just a robotic car: it was a robotic car being "driven" by a small flying locust. Bystanders stood in awe as they watched the insect and its vehicle zoom across the meeting room floor.

Since that demonstration, at a neurobiology conference in 2000, Dawson has thought a lot about the potential of using insects to control simple machines.

He has used his locust car as a tool for teaching university students how locusts fly and use their sensory-motor abilities for getting around.

To turn an ordinary locust into a locust driver, electrodes are implanted into the locust's flight steering muscles, called the M97. Because insects have hard exoskeletons, it's easy to locate the M97, then poke a small copper wire electrode, held by melted wax, into the muscles. The electrode conveys impulses to a microprocessor on the car, whose wheels individually reproduce the speed and direction generated by the locust's wings. The result – a locust-steered car – functions like a travelling laboratory that the insect carts around beneath it.

Created for fun in 2000, the car developed out of Dawson's PhD research at Queen's in the biology lab of Professor Mel Robertson, where Dawson first identified the importance of different muscles for controlled steering during flight. Dawson created the car along with his friend Ron Harding after they were inspired by an article in *Discover* about a Mothmobile, a moth-driven car, the brainchild of then-bioengineering student Steven Bathiche at the University of Washington.

Dawson and Harding imagined that, by swapping locusts for moths, the duo could create a Mothmobile spinoff that could provide unique insight into how locusts fly. Unlike other model insects ordinarily used in flight experiments, such as fruit flies and hawk-moths, locusts can't hover. This makes studying locust flight particularly challenging. The car makes it possible to gather data on locust flight while allowing the locust to fly forward.

Although 17 years ago Dawson thought the car might be a good tool for understanding flight, the locust car project has since taken him in a new direction. Now, the biology professor at Carleton University sees the locust car's main benefit as a teaching tool, to allow his students to gain insight into important concepts in neurobiology, engineering, neural-machine interfacing, and signal processing.

In using the locust car, Dawson's students are able to glimpse a simplified version of what goes on with human muscles. Like humans, locusts have fast twitch muscles, very similar in physiology to the muscles we rely on for everyday voluntary activity. This means that when a locust contracts its muscles, the mechanisms that whirl into action – the release of neurotransmitters, cycling of calcium, occurrence of action potentials – parallel those that play out in human muscles. However, in comparison to a human's muscle, a locust's neuromuscular system has far fewer components, which means there are fewer signals muddying up the reading. This makes it easier to understand general principles of biology.

In 2012, one of Dawson's students, Kevin Mai, took advantage of the locust's relative simplicity to conduct a project that explored locust vision.

The car-driving locust was implanted with an additional electrode that could record activity from a visual neuron that detects movement. Then he sent a Styrofoam sphere painted to look like a soccer ball slowly down a metal track toward the locust car and was able to find out what the locust's eyes were doing as the insect dodged the ball – or didn't.

"We had quite a few collisions," Dawson admits, which he attributes to the inability of the car to respond in time rather than to any of the insect's shortcomings.

Thankfully, no locusts are harmed in the driving of the cars.

"When we're done with the locusts we just pull the electrodes out and put the insects back in our colony and they go on quite happily living and breeding and doing what locusts do."

The locust car itself, though, hasn't seen much activity of late – it currently sits in a trunk in the back of Dawson's lab. Since he finds students are most engaged with a project when the impetus for their work emerges from their own personal interest, he doesn't assign students locust car experiments. And it just so happens that, in the past few years, Dawson's students have elected to focus their energies elsewhere.

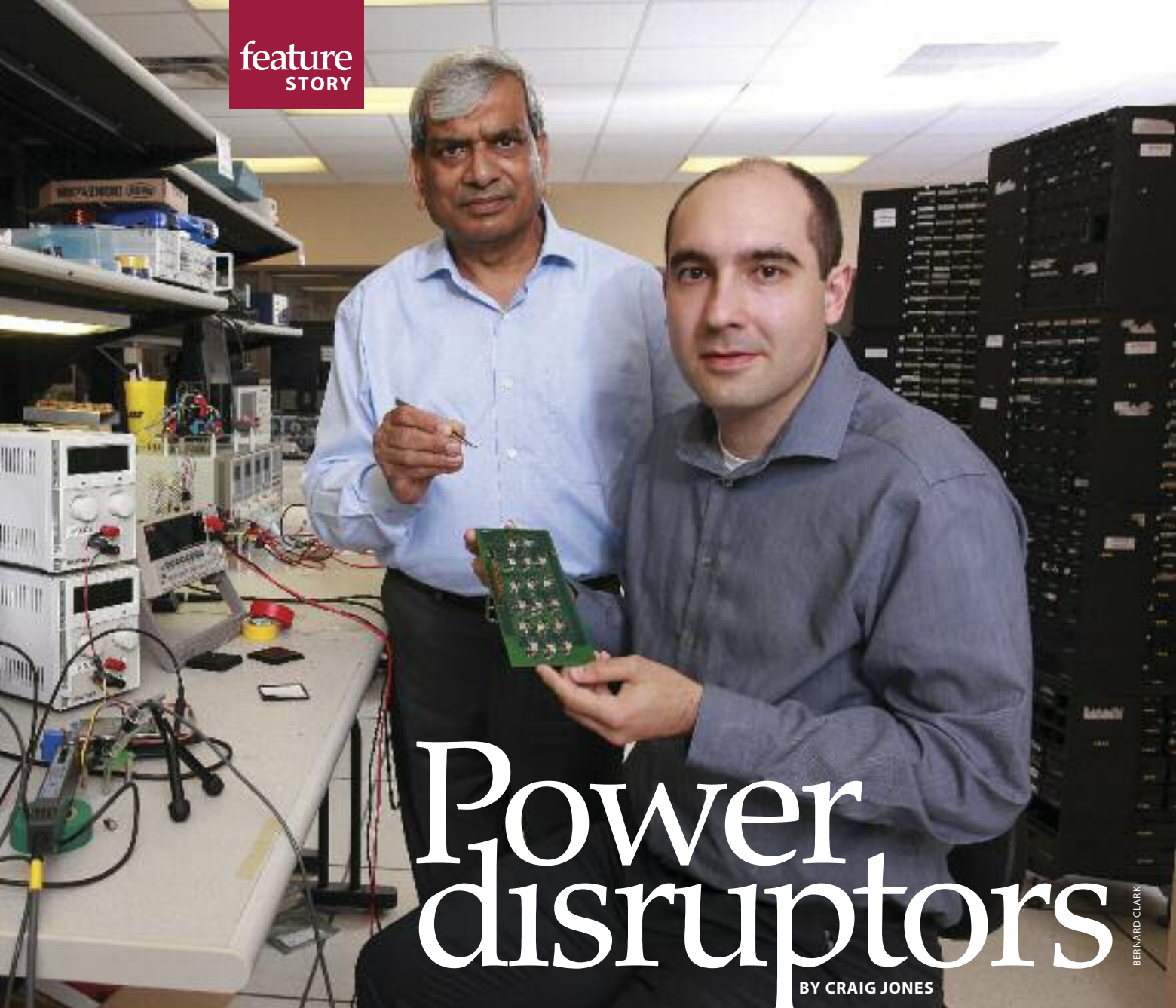
But that hasn't swayed Dawson's belief in the locust car as a powerful teaching tool.

"I'm just waiting for a student to come up and tap me on the shoulder and say, 'Hey Jeff, I really like biorobotics. Is there anything I could do in your lab that would teach me about this?'"

And then he will get the locust car out, ready for another spin. ■

*Learn more about Dr. Dawson's work and see what the locust car actually looks like: [ifg.carleton.ca](http://ifg.carleton.ca).*





# Power disruptors

BY CRAIG JONES

BERNARD CLARK

*In one of their labs at ePOWER, Praveen Jain, using tweezers, holds a tiny power converter. Marko Krstic holds a traditional integrated circuit board that can be replaced by the single microchip.*

Imagine a time in which electrical energy is generated all around you and the cost of that energy is continuously falling. Imagine that the only place to view electrical infrastructure, like transformers and telephone poles, is in a museum. Imagine that every building in your daily life generates the electricity that powers every device within it and charges a battery to maintain that power at night or when the sun is obscured. Imagine that the mass production of electrical energy does not add to the heating of the planet nor require massive public or private investments in unsightly carbon-producing infrastructure.



That's the future toward which Praveen Jain and his colleagues are working at the Queen's Centre for Energy and Power Electronics Research (ePOWER) in Walter Light Hall. ePOWER "brings together academic and industrial researchers to develop a broad range of applications and expertise, from power transmission to alternative energy, to power consumption to power application-specific integrated circuits." Its mission is to develop the innovative control algorithms and mathematical architecture to facilitate the application of existing and new technology toward cost-effective and efficient energy generation.

Dr. Jain, a professor in Electrical and Computer Engineering and head of ePOWER, is leading a team of researchers from Queen's, York, Western, and the University of Ottawa in a project – with support from the Ontario Research Fund-Research Excellence (ORF-RE). They are working to develop new technology to capture solar energy that, Dr. Jain predicts, "will enable us to have off-grid energy systems that are reliable and can give you a 24/7 supply of energy."

The current quest is for more efficient and ever-smaller micro-inverters that convert sunlight into electricity.

"The sun is the largest source of energy on Earth," Dr. Jain says. "We can very efficiently capture the sun's energy and convert it into electricity, which is the common form of energy that we use in everyday life. Currently we have renewable energy systems feeding power to the grid. We have the traditional system, and we have renewables. But what of the future? The current model hasn't evolved at all in a long time. In 50 years, what will our energy system look like? I'm of the belief that in 50 years we

will be off-grid. I don't think we will be connected to any sort of power grid at all. That's what this project is all about."

Solar panels convert sunlight into direct current (DC) electricity. But it's rough, unstable, erratic, and discontinuous. A solar panel – to be efficient – must operate at the maximum power point. So the challenge is to create the technology to get maximum efficiency out of a solar panel – and do it cost-effectively.

### The technological challenge

If anyone can do it, it is Praveen Jain. He is the Tier 1 Canada Research Chair in Power Electronics, and a Fellow of the Royal Society of Canada, the Institute of Electrical and Electronics Engineering (IEEE), the Engineering Institute of Canada, and the Canadian Academy of Engineering. He has authored or co-authored 550 publications. He holds 107 patents and has launched numerous spinoff companies that have translated his research into real-world applications. In 2011, he received the IEEE Newell Field Award, the highest international award in his field. Most recently, he received the Phoivos Ziogas Electric Power Medal from the Canadian branch of the Institute of Electrical and Electronics Engineers (IEEE) recognizing outstanding engineers who have made important contributions to the field of electric power engineering.

So, what exactly is "power electronics" and why is it so transformative? Power electronics is that cluster of technologies that – in a cost-effective and efficient manner – transforms and regulates and stabilizes solar energy to enable us to operate anything that runs on an electric current. It is a fundamental component of the

infrastructure of our increasingly wired and wireless lives – such that advances in this domain produce outsized consequences downstream where we register the effects. The more efficient and cost-effective power electronic technology becomes, the more stable and reliable – and ultimately cheaper – electricity becomes, and the more applications we can imagine and devise.

"One of the issues with solar energy is, of course, what do you do at night, or on cloudy days?

So we need to address

the storage of solar energy. Batteries are the most common form of electrical energy storage. With the development of electrical vehicles,"

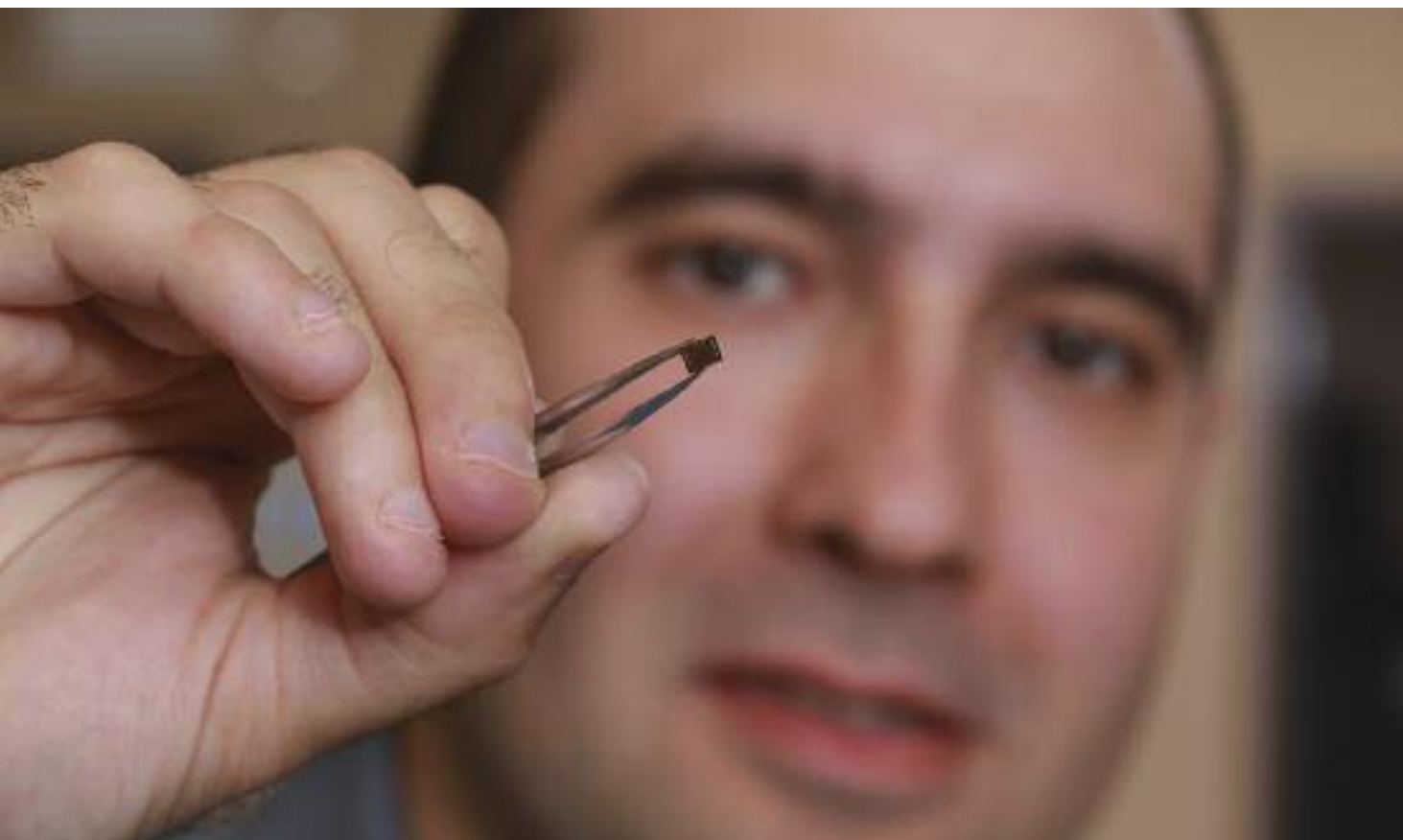
Dr Jain predicts, "you will see battery technology evolve very, very rapidly. Once that happens, we can do cost-effective energy storage. Now we want to address cost-effective solar energy capture."

*"In 50 years we will be off-grid ... That's what this project is all about."*

### The conversion challenge

Currently, Dr. Jain says, "the cost of taking solar energy and converting it into electricity is at par with the traditional energy sources." But conversion technology – which converts solar or battery direct current (DC) into usable alternating current (AC) – wastes a percentage of energy through dissipation in heat, which also shortens the life expectancy of the conversion technology. One important task – on which the centre is working – consists of designing technology that converts efficiently and cost-effectively without producing surplus heat.

Improvements extend from the macro-infrastructure of a continental energy grid to the operation of a nano-scale heart pacemaker for an infant, and all points in between. This is the domain in which Praveen Jain



BERNARD CLARK

*A closer look at a microchip developed at ePOWER.*

has made his career and toward which his students are making their contribution.

Why is power electronics so potentially disruptive? Because, to take one example, if this technology can be cost-effectively miniaturized and engineered to be more efficient, it can be built into existing construction materials so that a building can be made to generate its own power by turning every window or concrete surface exposed to

*A building can be made to generate its own power by turning every window or concrete surface exposed to sunlight into an electricity-producing solar cell.*

sunlight into an electricity-producing solar cell. These cells are then networked together and their yield is regulated and stabilized by technology developed at ePOWER to render even a simple family residence energy-independent.

As PhD student Marko Krstic describes it, "If you can extract more power from solar cells – even one per cent more – that's a very significant development. For this specific converter [a piece of technology developed for his graduate research], we achieved efficiencies that are up to 20 per cent higher than comparable converters that have been presented in industry and academia."

"The converter structure that was developed can be fully integrated into a single microchip that is only millimetres in size,"

Mr. Krstic says. "This is very difficult to achieve for existing power converters, which are typically constructed on circuit boards and made up of discrete components. We are able to achieve this while maintaining high efficiency, which means less wasted power."

Furthermore, he says, "sales of solar panels have not plateaued – as was predicted by many in the industry. Solar energy is now competitive with coal in some cases. So a device like this converter" – he is speaking of a microchip so small it would take six or seven to cover your thumbnail – "which can be integrated with the silicon solar cell to extract the maximum power out of them ... that's a big step forward." Even if solar cells are not as efficient as would be optimal in all circumstances,

their prices continue to fall. In time, their efficiency will rise so that it will make more sense to generate electricity autonomously than to connect to a grid. Combine these innovations with improvements in battery technology and the effect is compounded. These distributed energy technologies will become a disruptive threat to existing energy providers, infrastructure, and systems.

### The commercialization challenge

"At this moment," Mr. Krstic says, "we're in the process of patenting this technology, which we would like to move through quickly, so we can begin to present our work. It could be a real breakthrough and have an immediate impact."

"But it's not straightforward," Dr. Jain adds. "It requires a lot of complex mathematics, a lot of control theory, a lot of electronics, as well as integration of semi-conductors and complex mathematical functions into tiny transistors. So our collaboration with York, Western, and the University of Ottawa enables us to come up with a common architecture, and then the individual components of that architecture. Our task is to apply the existing science knowledge and mathematics to new applications. In the field of power electronics, most of the innovations these days happen because of the mathematics."

All very promising, but is

Canada positioned to take commercial advantage of these innovations? "That's the one caution I have," Dr. Jain says. "In this country, we do a lot of innovation, but we are not able to convert that innovation into wealth. Our innovation is going outside Canada and being converted into wealth elsewhere. We get money for basic research, but we lack the mindset to take on the risk of commercializing that innovation – which is not as true in the United States.

"Canadians," he observes, "are one of the most innovative people I have met. Why? I don't know. I have been working in Canadian industry for 30 years – they are very innovative – but they end up working in Silicon Valley or elsewhere in the U.S. Being a small country, there needs to be a more proactive role from government in developing basic industry. We can't depend on our resources – they are consumable things."

The development of small-scale solar power systems aims to break this dependence on dwindling resources. None of this will happen overnight – it will take decades – and it's too soon to know how much of the commercial benefits will be captured and retained by Canadians, but the tiny converters being designed and produced at ePOWER will be the stuff of massive change. ■

*Learn more about ePOWER:  
[queensu.ca/epower](http://queensu.ca/epower).*

---

Photovoltaic (PV) or solar cells convert photons of sunlight into electricity. PV cells are made out of semi-conducting materials like silicon. When sunlight strikes the silicon, electrons are excited from their atomic orbit. The energy created can either be dissipated through heat or captured by an electrode in the form of direct current (DC) electricity. Technology currently being developed at Queen's converts direct current into alternating current (AC). The technology for converting DC into AC and rendering it stable enough to be useful and reliable is on the verge of a major breakthrough – and Queen's is on the cutting edge of that breakthrough.

---



Queen's  
UNIVERSITY

two NEW programs in  
**BIOMEDICAL  
INFORMATICS**

**Graduate Diploma**  
four courses, May – August.

**Professional Master's**  
six courses + research project, May – April.

Classes start May 2018.



Transforming **health care**  
through **big data**.

[bioinformatics.queensu.ca](http://bioinformatics.queensu.ca)

# KEEPING in touch

## News from classmates and friends

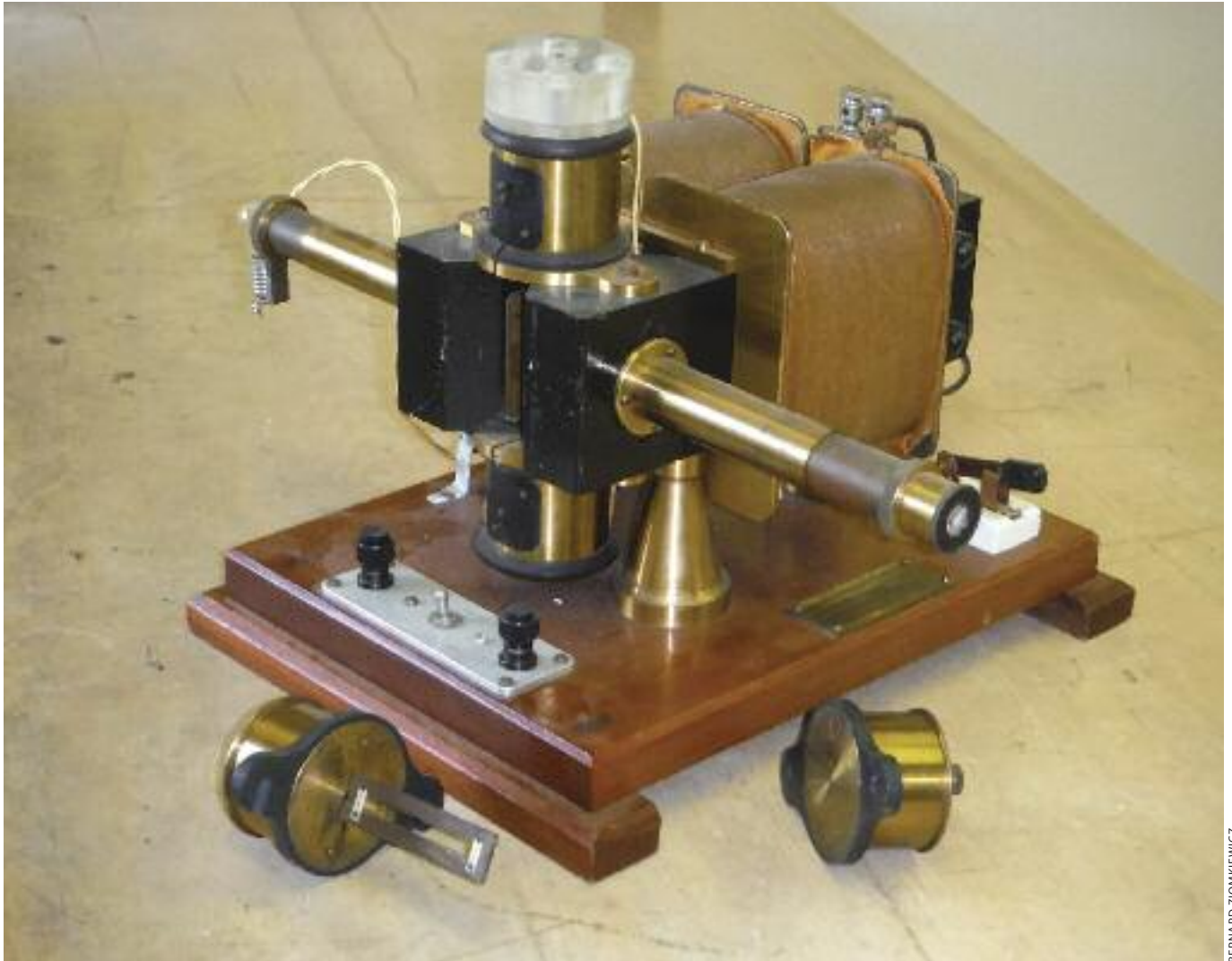
Send notes to: [review@queensu.ca](mailto:review@queensu.ca)

Phone: 613.533.6000 ext.77016

Online edition: [queensu.ca/alumnireview](http://queensu.ca/alumnireview)

Queen's Alumni Review, Queen's University  
99 University Avenue, Kingston, Ont. K7L 3N6

To update your address or change your subscription  
from print to digital, email: [review.updates@queensu.ca](mailto:review.updates@queensu.ca)



BERNARD ZIOMKIEWICZ

**The Einthoven galvanometer** Invented in 1903 by Willem Einthoven to measure the very small electrical signals in the human heart, this device became extremely useful in nuclear physics research for measuring small, rapid changes in the electrical charge of an electrometer as it interacted with ionizing radiations. Galvanometers of similar sensitivity existed at that time but did not have the rapid response time of the Einthoven.

A conductive wire (often a silver-plated quartz fibre) is suspended between the poles of a strong magnet. A current flowing through the wire generates a force that causes it to be displaced by the magnetic field, proportionally to the magnitude of the current. A light and telescope are used to observe the deflection against a scale. It is possible, as well, to cast the shadow of the wire on a moving strip of photographic paper, thereby creating a continuous record of its motion.

This device was constructed in 1921 in the physics department workshop, at a time when Queen's was very involved in research of the then-new field of nuclear physics. It is part of the historical collection of the Department of Physics, Engineering Physics & Astronomy. [queensu.ca/physics/historical-collection](http://queensu.ca/physics/historical-collection)

Unless otherwise indicated, dates in these notes refer to 2017.

## Up to 1959

### Deaths



**David Bertram Bailey**, BSc'59, died May 16 in Calgary, aged 84. He is survived by his daughters Lydia and Julia, three grandchildren, and a great-grandson. After graduating from Queen's, Dave moved to Montreal where he met Betty, his future wife. In the late 1970s, Dave founded and ran Gentle Numbers, Incorporated, which serviced numerical controls. He had one employee, his daughter Julia. In 1989, Dave began work full-time on a family genealogy, which culminated in the book *BAILEY – My Family Search* that documents the descendants of John Bailey who came from Ireland in 1834. Dave spent more than 15 years driving around North America and met more than 500 relatives. He visited every province and state in the continent. Every day he got older and wiser. Dave was a much loved father, grandfather, and great-grandfather.

**Ralph Robert Beardsley**, BSc'47, died May 9 at home in Ottawa. He was predeceased by his wife, Barbara, and grandson Tommy. He is survived by his four children and extended family. After Barbara's death, Bob found happiness for a few years with Margaret McBurney and will be missed by her family and the friends he met through her. After graduating from Queen's, Bob worked in Panama for a telephone company before returning to Canada, where he got a job teaching in a one-room schoolhouse in Shawville, Que. He decided he preferred teaching to engineering. He worked as a teacher for many years, mostly in Ontario but he also enjoyed a two-year contract with CIDA in Trinidad and Tobago. He taught at Central Technical School in Toronto and at an alternative school called SEED before becoming the principal at Eastdale Collegiate Institute. Barbara and Bob started their political careers as members of the CCF party. They went on to be founding members of the NDP. They were a

formidable team, committed to social justice, community, and family. Bob continued his political work for many years, managing election campaigns for the NDP across the country. Social justice played a major role in his life and work. He was good at chairing meetings: he listened to everyone's opinion, he anticipated problems, and he managed any crisis in a calm, cool manner. Bob was a man of integrity; he was generous, wise, patient, and fair.

**Winston G. Chambers**, BA'56, died Jan. 8 in Ottawa. He is survived by Doris, his wife of 71 years, sons Max and Richard, and grandchildren Brenda and Daniel. Already married with one son when he came to Queen's in 1952, Winston helped to sustain the family by working as a sleeping-car steward with CPR while Doris worked with Jean Royce in the registrar's office. Winston graduated with an MA from the London School of Economics and joined the Department of Energy, Mines and Resources in Ottawa where he retired as a senior adviser to the Deputy Minister. Winston never lost his intellectual curiosity, his love of music, his affection for Queen's, and the friendships forged at that time.

**Wilfred Arthur Darby**, BCom'49, died April 6 in his 96th year. He was the beloved husband of Jeanie Darby for 67 years, loving father of Kim (Catherine) and the late Jane Darby-Hipple (Don), and cherished grandfather to Rebecca and Thomas. Wilfred served in the RCAF, 1942–45. He was honoured to serve with his fellow Canadians and members of RAF 8th Squadron and RAAF 454-459 squadrons in the Middle East. Wilfred worked for Stelco as an assistant comptroller, retiring in 1986. In retirement, he was an accomplished landscape artist.

**Robert Duckworth**, BSc'55, died March 10 in Oakville, Ont. He is survived by his wife, Anne, and daughter Susan.

**Robert J. Gray**, BSc'48, died June 24, 2016, at home in Brighton, Ont. After getting his degree in electrical engineering, Bob worked for Canadian General Electric in Peterborough for 20 years in turbine generator design.



In 1967, the family relocated to Toronto where Bob spent two more years with the company before joining Ontario Hydro. There, he was responsible for

the supervision of turbine generator maintenance throughout Ontario. Bob leaves Patricia, his wife of 68 years; children Linda (Brian West), Richard (Cheryl), and Catherine; six grandchildren; and three great-grandchildren.

**Lloyd Bernard Jones**, BA'57 (Arts'58), MEd'75, died Jan. 15. He is survived by his wife, Barbara (Goodman), NSc'57, children Steve, Ellen, and Lauren, and two grandchildren. Lloyd taught high school history in Chesterville, Collingwood, and Belleville for 33 years. He also taught several semesters at McArthur College. He was involved in curriculum design and innovation for the Hastings Board of Education and became a superintendent of education. Lloyd led many educational student trips to the Mediterranean in the 1970s. After his retirement, he wrote two books on the Crow/Bobs Lake area where he grew up and later cottaged. He was an avid outdoorsman and was able to identify all the local flora and fauna. His curiosity about the world around him never waned.



**Jane (Freeman) Lewis**, BA'52, died April 25. She is survived by Viggo ("Lou") Lewis, Sc'52, her husband of 62 years; their children David

Lewis (Jane Ravenshaw), Linda Lewis Cochrane, Artsci'77, MBA'79 (Gregory Cochrane, MBA'74), Deborah Lewis Gray, Artsci'80, MBA'82 (Brian Gray), and Robert Lewis (Anita Lewis); and grandchildren Laura Lewis, James Cochrane, David Cochrane, Com'12, Edward Lewis, Thomas Gray, Artsci'17, and Robert Gray, Sc'19. Jane and Lou met at Queen's; they were married in Belleville, Ont.,

where they lived until 1977. After a few years in Illinois for Lou's work, they moved to Oakville, Ont., where Jane was happy to be close to her children, all in Toronto. Jane was devoted to her family. She was a great animal lover and was happiest when there was a dog in their home. She was also a gifted piano player, able to play any song by ear, entertaining family, friends, and residents of Oakville Trafalgar Memorial Hospital. The best times for Jane were those spent with family at their cottage on Kamaniskeg Lake.



**Murray Kendall Mathieson**, BSc'55 (MEd, U of T), died April 12 in Guelph, Ont., aged 85. Murray studied mechanical engineering at Queen's,

following in the footsteps of his father, Thomas Stanley Mathieson, BSc'26. Murray was predeceased by his first wife, Trudy (Orr), and more recently by his son Bruce (Karleen Bird). Murray is survived by Fran Corner Little, his wife of 32 years; children Heather, Artsci'79 (Brian McMillan, Sc'79), Alexander, and Jean (Mark Vanderheyden); seven grandchildren; and siblings Neil Mathieson and Miriam Barry, Artsci'79. After nearly 30 years as a teacher with the Scarborough Board of Education, Murray retired in 1991 as head of the mathematics department at Sir Wilfrid Laurier College Institute. He and Fran settled in Guelph. In retirement, they lived life to the fullest, paddling, sailing, and curling in between their travels throughout the world. Murray was a life member and past president of the Guelph Men's Club, a member of the Guelph Wellington Seniors Association, and a founding member of the Evergreen (GWSA) Canoe Club. The club has honoured Murray's memory by naming one of its canoes "Murray's Passion."

**Anthony Petrina**, BSc'59, died March 27 at home in Vancouver with his beloved wife, Gloria, at his side. Tony started from humble beginnings in the mining town of Geraldton, Ont., but went on to be a leader in the international mining scene. Early



out of high school, he lied about his age so he could work underground as a tramp miner in the mining camps of Northern Ontario. With a couple of years of hardrock mining and a year of engineering at Lakehead Technical School under his belt, Tony joined the Queen's class of Sc'59. In addition to his mining studies, Tony led the science formal committee. He married Gloria in his fourth year. After graduation, the couple migrated west where Tony began a long, commanding career with gold miner Placer Inc. (later Placer Dome Inc.). He became CEO and president of the company. He also sat as either a director or chair on more than a dozen resource-based companies, associations, and charities. Tony is survived by Gloria; children Michael, Sc'82, David, Sc'89, Susan, and Jennifer; and grandchildren Nicholas, Jackson, Georgia, ConEd'22, and Samuel.



**Alexander Szabo**, BSc'53 (MSc, McGill, PhD, Tohoku), died June 11. He is survived by Terry, his wife of almost 60 years; children Susan

(Andrew Thorne), John, Eleanor, and Jennifer; brother Frank, Sc'59, MSc'61 (Dorothy); and nephews Andrew, Michael, and Peter. Alex worked as a laser physicist at the National Research Council: he continued his work as a researcher emeritus right up to the end. He helped build, in 1960, the first laser in Canada; it was later donated to the Canada Science and Technology Museum.

**Alexander "Sandy" Webster**, BA'49, died March 22. He was predeceased by his wife, Ruth, and his siblings, including Stewart, BA'43, MA'44 (Professor Emeritus, History). Sandy is survived by his children Bruce, Gail, and Craig, Artsci'90, and their families. Sandy served as a flying officer in the Second World War before coming

to Queen's. As a student, he was active in CFRC Radio and was inducted into the Tricolour Society in 1948–49. He provided a planned gift for Queen's in the form of an annuity for the general bursary fund. Sandy had a distinguished acting career in radio, television, film, and theatre, receiving a number of awards for his work, including the 1991 Silver Ticket Award for lifetime achievement in theatre, given by the Toronto Alliance for the Performing Arts. Sandy was an advocate for his fellow artists, working as union president for Canadian Actors' Equity, as director of Equity Showcase, and as vice-president of AFC, a charity providing assistance to ill or needy theatre workers.

## 1960s

### Family news

On Aug. 12, **John Mark**, MSc'69, and his wife, Catherine (Hutchison), celebrated their 50th wedding anniversary. They can be reached at [jmark1490@rogers.com](mailto:jmark1490@rogers.com).

**Boyd Moorcroft**, Arts'61, and his wife, June, celebrated their 60th wedding anniversary on Aug. 24. They live in Belleville, Ont. Boyd and June have five children, all Queen's grads.

### Honours

**Rick Bunt**, Arts'68, was recently honoured by his peers, receiving the CUCCIO Community Award from the Canadian University Council of Chief Information Officers. Rick was a founding board member and the first elected president of CUCCIO. He is an emeritus professor (Computer Science) and former CIO at the University of Saskatchewan. Rick was cited for his "commitment to making collaboration happen, not only for his institution, but for the Canadian higher education IT community over-all." Rick received his award at CANHEIT 2017, an annual conference for IT professionals in higher education that was hosted by Queen's this year.

### Notes

**David Edney**, Arts'63, Artsci'10, was on the selection committee for the 2016 Governor General's Literary Awards (Translation from French to

Broaden your opportunities  
and take the first step to earning  
your Queen's MBA

# Queen's

## Graduate Diploma in Business

Learn the fundamentals  
of business in just 4 months

- Program runs May-August
- Earn credits toward an MBA
- Designed for recent graduates of any discipline
- Broaden your career prospects

For more information

855.933.3298

[gdb@queensu.ca](mailto:gdb@queensu.ca)

[ssb.ca/gdb](http://ssb.ca/gdb)



English). David's translation of Jean Giraudoux's *The Madwoman of Chaillot* is being performed at the Stratford Festival Aug. 3 to Sept. 24. An emeritus professor of French at the University of Saskatchewan, David lives in Saskatoon and spends four months every year in Paris.



Members of **Meds'65** had a mini-reunion in April. Seen here: Don Hilton, John "Jocko" Lockett, and Murray Mitchell (front row); George Franko and Tom McQueen (second row); Dave Smith and Jim Sparling (top row). Thanks to Don Hilton for the photo.

## Deaths



**Donald Cousens**, BA'61 (MDiv, U of T, LLD, York), died Feb. 23 in Markham, Ont. Predeceased by his wife, Aline, and brother James, BA'58, Don is sur-

vived by his children Mary, Mus'92, and Paul, and their families. Don was a lifelong learner who embraced all of life's adventures. Following a career as a Presbyterian minister in Penetanguishene, Don worked in the high-tech industry in an executive role from 1967 to 1992. Elected to the York Region District School Board in 1972 as trustee, he served as board chair, 1978-79. From 1981 to 1993 he was Markham's MPP, serving as deputy speaker, minister of corrections, and opposition critic for environment and finance. Don was first elected mayor of Markham in 1993 and served four successive terms. Some of his proudest accomplishments were his work to introduce anti-smoking legislation in Ontario, establishing Markham as a high-tech business hub, and helping to build

Highway 407. Among his many honours was a public school in York Region District named after him. Don will be remembered for his keen mind, love for family, and sense of humour. He served his community with honour, good character, and hard work. A proud Queen's grad, many of his lifelong friendships began at Queen's.

**Nancy (Beckett) Duez**, BA'66, died June 19 at the age of 72. Nancy was a skilled bilingual editor and writer. She had a lifelong love of animals and the outdoors. Nancy will be deeply missed by her many pets, family, and friends. She was the loving mother of Estelle, Pierre, Marc, and Sacha; the cherished friend of Marc Duez; and the beloved grandmother of Ewan, Alec, Claire, and Ella.

**Imre Gombos**, BSc'62, died March 24 in Cumming, Ga. He is survived by his wife, Carol (Aitken), Arts'62; children Peter, Artsci'91, and Barbara, and their spouses; and two grandchildren. Imre came to Canada from Hungary in 1957 after months living in refugee camps. He maintained a lifelong passion for the Hungarian language and history. After completing his degree in engineering physics, Imre went on to a career with Nortel, working for the company in cities across Canada and in Georgia. He and Carol attended their 50th anniversary reunion at Queen's in 2012.



**Carson Douglas Gray**, BSc'65, died April 19 in Ottawa, aged 75. At Queen's, Carson studied electrical engineering and volunteered at CFRC Radio. He went on to a career in telecommunications, working at Westinghouse, Bell Northern Research (BNR), Nortel, and Mitel. Carson is survived by his wife, Janet, children Tina and Steven, and their families.

## 1970s

### Honours

**Ron Abrahams**, Meds'77, has been awarded the Meritorious Service Cross. The Meritorious Service



Decorations were created by Her Majesty Queen Elizabeth II to recognize Canadians for exceptional deeds that bring honour to the country. Ron was

honoured "for his vision and leadership for promoting an innovative model of care for pregnant women challenged by substance use, as well as access to a supportive network and tools to lead healthy lives beyond hospital walls," by developing FIR (Families In Recovery) Square as the founding medical director, perinatal addictions, at B.C. Women's Hospital.

### Notes

**Simon Leibovitz**, Ed'79, recently completed his 15th year at The Retired Teachers of Ontario (RTO/ERO) where he is the CAO. He looks forward to his own retirement in just over two years' time! He is proud of his twin sons, Ben and Gavin, who recently turned 23. Ben graduated last spring from Western with his Bachelor of Music, with distinction, having made the Dean's list all four years; he is now pursuing his master's degree there in music theory. Gavin has recently graduated from the co-op program at the University of Waterloo with his bachelor's degree in accounting and financial management. Simon continues to live in Guelph and commutes daily to Toronto to RTO/ERO's downtown office.

**Tom Mawhinney**, Arts'73, MA'81, PhD'87 (Psychology), has two new musical projects in the works. The first is a professional recording of some of Tom's original songs performed by two local choirs – Melodia Monday and the Eccentric Vocal Ensemble – and a choir in Florida, where Tom spends much of his time. Tom writes, "Both Canadian choirs include several Queen's graduates, including four in Melodia Monday with whom I appeared in several QMT productions in the early '70s." The finished product will be a CD, *Three Choirs at Christmas*. You can also check out Tom's YouTube channel for music videos. Tom is also coordinating a four-city tour of the famous



Tuskegee University Golden Voices concert choir. In March 2018, the Alabama choir will make stops in Ottawa, Toronto, London, and Kingston, where it will be hosted by the Open Voices choir, founded and directed by Andy Rush, Mus'85, Ed'86, MED'02.

## Deaths



**Anna Maria (Giangregorio) Marshall**, BA'69 (Arts'70), (BEd, U of T), died peacefully on Feb. 4 with her family at her side. She is survived by

Murray, her husband and best friend for 45 years, her sons Allyn and Bryan, Artsci'03, MSc'06, and three grandsons. Born in Tione, Italy, in 1947, Anna Maria disembarked at Pier 21 in Halifax in February 1951, arriving in Hamilton after a cold train ride. Upon completing public and secondary school there, she enrolled at Queen's, graduating in French and English. Anna Maria

enjoyed a successful teaching career, interrupted by seven years of child-rearing, in Stoney Creek, Elgin, and Kingston. Anna Maria loved travelling to Italy and France. Her many interests included reading good literature, knitting, skiing, golf, hiking, and bridge at the Queen's Women's Association, where she made many friends. Proud of her Italian ancestry, she took great pride in her close-knit family.

## 1980s

### Honours



**Annette Borger-Snel**, Artsci'87 (MSc, Syracuse), won a prestigious Humber College Innovation Award in

June. Annette is a professor of public relations and the program coordinator for one of Canada's leading PR training courses. The awards recognize initiatives that have a positive impact

on Humber students' educational process. Annette won for her PRC Career Excellence project, which helps students with meaningful career options, including connecting them to personal industry contacts; reviewing resumés, portfolios, and writing samples; coaching; and interview preparation. "I proudly share this award with nine amazing PRC faculty," writes Annette. She can be reached at [annette.borger-snel@humber.ca](mailto:annette.borger-snel@humber.ca).

**Christopher de Haan**, Artsci'88 (Geography), was awarded the David Thompson Award, a National Survey award for the use of an innovative survey method in the category of "Challenging Cadastral Survey Project" at the National Surveyors Convention held in Ottawa in March. Christopher's project was "Survey the Natural Boundary of the Toquana Indian Reserve #4." Christopher's company, Underhill Geomatics Ltd., was hired to conduct the survey of the area, which included a boundary limit defined by the highest tide of the Theodosia Inlet. Time constraints

Planning Makes a Difference

Image courtesy of Queen's Archives - Queen's Picture Collection



Remember Queen's yesterday, today, and tomorrow.

Office of Gift Planning | 613-533-2060 | 1.800.267-7837  
[gift.planning@queensu.ca](mailto:gift.planning@queensu.ca) | [queensu.ca/alumni/giftplanning](http://queensu.ca/alumni/giftplanning)



imposed by the daily tide required ingenuity to do an accurate survey. Christopher writes, "A drone was used to obtain 800 aerial photographs of the area during high tide and elevations were derived from the digitally derived ortho-photograph. The contour of the measured high tide elevation was used to delineate the limit of the high tide and the natural boundary of the parcel of land. The only issue with the survey was that the grizzly bears in the area liked to play with the photo targets used to coordinate the ortho-photograph."



Brigadier-General (Retired) **Ken Watkin**, Law '80, LLM '90, received the 2017 Francis Lieber Prize for his book *Fighting at*

*the Legal Boundaries: Controlling the Use of Force in Contemporary Conflict* at the American Society of International Law's annual meeting in Washington, D.C. in April. The prize is given annually by the Lieber Society on the Law of Armed Conflict to the author of a book considered outstanding in the field of law and armed conflict. A review published in the 2017 *International and Comparative Law Quarterly* stated the book is "a highly authoritative monumental treatise" that "should appeal to a broad audience encompassing military lawyers, military strategists, military commanders and thinkers, policymakers, strategic advisers, indeed to anyone with an interest in getting to the bottom of what is driving current security concerns and operations." Ken's wife, Maureen

Watkin, Artsci/ConEd'80, and daughters Jessica Winkelmann, Artsci'08, Allison Watkin Artsci'10, and Emily Watkin, Artsci'14, are all very proud.

### Job news



**Nosa Egiebor**, PhD'85 (Metallurgical Engineering), is now provost and executive vice-president of the SUNY College of Environmental Science and Forestry in Syracuse. Previously, he was chief international officer and professor of chemical engineering at the University of Mississippi in Oxford, Miss. He is a member of the U.S. Environmental Protection Agency's Science Advisory Board and the recipient of numerous national and international awards, including the U.S. Department of Energy Award for Outstanding Research and Educational Accomplishments, the Alexander von Humboldt Fellowship in Germany, and the U.S. Fulbright Scholar award.

His research focuses on the areas of industrial water and wastewater treatment, biomass conversion for activated carbon and biofuel production, solidification for low-level radioactive waste treatment, and mining and milling waste management.

**Blaine Price**, Artsci'87, Artsci'88, has been awarded a personal chair and is now professor of computing at the Open University, U.K. Blaine's research involves wearables and Internet of Things technologies applied to health and well-being as well as digital forensics and privacy. He has a number of research grants working

with hospital clinicians and is currently working on the issue of helping elderly patients leave hospital earlier so they can recover at home.



**David P. Siderovski**, Artsci'89 (PhD, Toronto), director of West Virginia University's MD/PhD Scholars Program, invites

all Queen's grads to consider WVU's exceptional, dual-degree training opportunity. After five years as chair of WVU Physiology and Pharmacology, David accepted a new challenge this summer, incorporating WVU's Department of Neuroscience into his chairperson's portfolio. David's own studies on Regulators of G protein Signaling (RGS proteins), begun at Queen's Biochemistry in 1987, have produced more than 150 published works, four patents, and more than 18,000 citations.

Lieutenant General **Chris (Edwards) Whitecross**, Sc'84, has moved to Rome with her husband, Ian, to take on her new role as commandant of the NATO Defense College. Lt.-Gen. Whitecross is the first female officer to hold this position.

### Notes

At spring convocation at Saint Mary's University, this illustrious group of St. Mary's faculty/Queen's PhD graduates came together for a photo. Seen here: Meghan E. Norris, PhD'11 (Social Psychology); Cathy Driscoll, PhD'94 (Management); E. Kevin Kelloway, PhD'91 (Organizational Psychology), Tier 1 Canada Research

Experience our unique, integrated approach to practical and academic study across the performing arts

[sdm.queensu.ca](http://sdm.queensu.ca)

**DAN SCHOOL OF DRAMA AND MUSIC**



*Be Remarkable.*

## **She arrives knowing it all. She leaves curious about everything.**

An open mind is key to adapting and thriving in a constantly changing world. It's where limits end and unexpected possibilities begin.

That's why, as Toronto's only all-girls, all-years IB World School, we embrace a global outlook. We cultivate inquiring minds that seek new ideas and unfamiliar ways of thinking. We inspire a lifetime of discovery and intellectual growth.

Did you know that our graduates are routinely welcomed at top universities in Canada and throughout the world – most with scholarship offers? Please come to our Open House. We'll answer all your questions.



**BRANKSOME  
HALL**

Canada • South Korea

An all-girls, all-years IB World School  
Discover our global study-abroad program

**OPEN HOUSE: Oct 24, Nov 3 and Dec 5**



Chair in Occupational Health Psychology; Steve Smith, PhD'00 (Social Psychology), Dean of Science; Gordon Fullerton, PhD'00 (Management); J. Kevin Vessey, PhD'87 (Biology), Associate V-P Research and Dean of Graduate Studies. Thanks to Dr. Vessey for the photo.



**Pat Andrews,** Com'83, after a 33-year career with Manulife in Canada and Japan, has retired from his position as V-P, information technology.

He plans to spend more time travelling, golfing, curling, and pursuing his woodworking hobby. Having visited the edges of all seven continents over the past 15 years, mostly by cruise ship, Pat and his wife, Leslie, plan to fill in the middle sections of their travel map.

**Lisa Little,** NSc'89 (MHS, Athabasca), has been elected to the International Council of Nurses (ICN) board of directors for a five-year term. Operated by nurses and leading nursing internationally, ICN works to ensure quality nursing care for all and sound health policies globally. Lisa is also CEO of Lisa Little Consulting, a health policy/strategy organization. She teaches the management/leadership course in Queen's undergraduate nursing program.

**Julia Ringma,** Artsci'80, Law'84, begins work on her PhD in philosophy this summer at Bowling Green State University (BGSU) in Ohio. BGSU has an interesting applied ethics program where Julia will be looking at the metaphysics of identity and how identity gets applied to issues like nationalism and prejudice, and how the Other is viewed from the perspective of one who has no locational roots. Julia also has an MA in philosophy from Carleton University.



**Roy Slack,** Sc'82 (Mining Engineering), was appointed in May as president-elect of the Canadian Institute of Mining, Metallurgy and

Petroleum, the leading technical society of professionals in the Canadian minerals and energy industries. In June, he was awarded an honorary doctorate by Nipissing University. Previous honours include the Engineer's Medal for Entrepreneurship from the Professional Engineers of Ontario in 2008 and the Metal Mining Society Award from the Canadian Institute of Mining in 2009. In 2012, Rotary International named him a Paul Harris Fellow. In 2013, he was appointed to the Province of Ontario's first Prevention Council to advise the government on workplace safety. Roy, a native of Kingston, now lives in North Bay, Ont. He is founder and president of Cementation Canada, a mine contracting group that carries out mine construction projects around the world.

## Deaths

**Jeffrey Hudson,** Sc'87, died peacefully after a courageous battle with scleroderma on July 27, 2016, with his family by his side. Jeff was a beloved father, husband, son, brother, and friend. He is survived by his wife, Dawn (Crellin), Artsci'87, daughters Chloe and Kate, and extended family. Jeff had a real zest for life. His interest in both cars and engineering drove him to take part in the Innovative Vehicle Design Competition, representing Queen's at Expo '86. Jeff and his team earned third place in the competition. After graduation, Jeff went on to have a successful career as a mechanical engineer at Xerox and more recently as a director at 3D Systems in Wilsonville, Ore. The family had moved to Oregon in 2007 and Jeff loved the Pacific Northwest, but he never forgot his Canadian roots. Jeff was a car enthusiast, hockey fanatic, and saxophone player. He loved helping people in any way he could. Jeff suffered from an extremely aggressive form of scleroderma; he

really wanted to share his story in order to raise awareness about this debilitating autoimmune disease. To learn more about his personal journey, visit [jeffhudsonjourney.blogspot.com](http://jeffhudsonjourney.blogspot.com).



**Catherine (Kate) Mullin,** BA'80, died March 31 in

Ottawa. She is survived by her daughters Emma, Artsci'11, and Andi Wardrop, her former husband, Tim Wardrop, Artsci/PHE'79, MBA'81, and extended family and many friends, including her canine buddy Zoe. After studying sociology at Queen's, Kate went on to a career in community health, working for the Centretown Community Health Centre before starting her own company, Kate Mullin and Associates.



**Brett Sampson,** BA'88, EMBA'99, died peacefully in his home surrounded by his family on June 26, 2016, after a long battle with cancer.

He leaves behind his wife and best friend of 30 years, Kim Townsend, Artsci'88, beloved daughters Brooke, Charlotte, and Tess, and extended family. After graduating from Queen's Economics, Brett spent the next couple of years travelling throughout Asia and working in a U.N. Cambodian refugee camp in Thailand. Upon his return, he completed his MBA, started his family, and built his career in the printing industry. Brett is remembered by his selfless nature, compassionate soul, adventurous spirit, and profound integrity. Brett was a person who made the world a better place. His big smile could light up any room and his love of learning never ceased. He had many passions, including canoe tripping, cycling, skiing, "fixing things," reading, gardening, and anything to do with airplanes.

## 1990s

### Births

**Maxwell Saegert,** Artsci'99, and his spouse, Christina Marie, welcomed

Lucas Michael on March 19, a brother for Thomas Maxwell and Ella Marie. Lucas is also welcomed by uncle Ken Darlington, Sc'92, and aunt Kim (Saegert) Darlington, Com'93, and grandfather Peter F.M. Saegert, Sc'59.

### Family news

**Mary Cousens**, Mus'92, was bereaved by the death of her father, Donald Cousens, BA'61. (Donald's obituary is listed in the 1960s section.) Queen's friends can reach Mary at [mary.cousens@yrdsb.ca](mailto:mary.cousens@yrdsb.ca).

### Honours



**Heather (McDonald) Geiger**, Com'92, was named a 2017 Emerging Training Leader by *Training Magazine*. Heather was nominated by her INSEAD business partners for stellar leadership of the INSEAD-Accenture online strategy certificate program. This program also earned the Gold Chief Learning Officer (CLO)

Business Partner Award in 2016. Heather celebrated 25 years with Accenture in June.

### Job news



**Dale Russell**, Sc'91, is now deputy practice leader at Urban Engineer's aviation division. In his new role, he will lead aviation efforts in northeastern and southeastern Pennsylvania, eastern New York, New Jersey, and New England. Dale has been in Urban's aviation department in Philadelphia since 2009, after previously serving in the firm's highways department. He has led design efforts at Bradley International Airport in Connecticut including a new terminal, a new consolidated rental car facility, an existing terminal demolition, and various airport roadway relocation projects. At Trenton-Mercer Airport in New Jersey, he leads on-call efforts that include planning, design, and construction in support of a master plan update.

### Notes



*Cha ghèill!* The picturesque town of Pitlochry, Scotland, was the site for a recent gathering of nine Queen's alumni, drawing participants from Vancouver to Helsinki for a weekend including haggis, whisky tasting, clay pigeon shooting, and occasional glimpses of sunshine. The rousing success of the three-day weekend – all participants emerged intact with only slight signs of wear – has already sparked talk of where to hold the next meeting, with Kingston in autumn 2018 a strong contender. *Seen here:* Andrew Hogan, Artsci'93, Mark Morrison, Artsci'93, Law'95, Mark Charles, Artsci'93, Tony Cochrane, Sc'93, MBA'06, James Bruce, Sc'94, Nick Harnack, Artsci'93,

## Congratulations to our **Branch Award** recipient



### The Johnson Award CALGARY BRANCH November 9, 2017 Evan J. Hazell, Sc'81

The Calgary Branch is proud to recognize Evan Hazell for his distinguished career in the energy and finance industries and his lifelong contributions to numerous corporate and community organizations in Calgary.

During his 20 years as an energy investment banker, he has led as managing director at major financial institutions, including HSBC Global Investment Bank and RBC Capital Markets.

A dedicated Queen's volunteer and benefactor, Mr. Hazell made a generous philanthropic donation to the Faculty of Engineering and Applied Science. His gift created The Hazell Endowment in Chemical Design and Innovation and was named in honour of his parents John, Arts'55, MA'56, and Mary Hazell, NSC'56.

Thank you Evan for all that you do for Queen's and your community. Learn more about the Queen's University Alumni Association Branch Awards, at [queensu.ca/alumni](http://queensu.ca/alumni)



QUEEN'S UNIVERSITY  
ALUMNI ASSOCIATION

# WELCOME HOME

All classes ending in '2' or '7' and all members of Queen's Tricolour Guard (classes of 1967 and earlier)

*Special programming to celebrate Reunion Zero, 5th, 25th, 50th, and Tricolour Guard*



PHOTO CREDIT: Maisha Syed, Artsci'18

**REGISTER NOW**

[queensu.ca/alumni/homecoming](https://queensu.ca/alumni/homecoming)

1.800.267.7837

✉ [reunions@queensu.ca](mailto:reunions@queensu.ca)

Thank you to the hundreds of alumni reunion and class volunteers for their commitment and dedication. Update your address with Queen's to receive your class reunion details. [queensu.ca/alumni/updateaddress](https://queensu.ca/alumni/updateaddress)

## HOMECOMING

**October 13 – 15**



[queensu.ca/alumni](https://queensu.ca/alumni)



[alumni@queensu.ca](mailto:alumni@queensu.ca)



[@queensualumni](https://twitter.com/queensualumni)



[/queensualumni](https://facebook.com/queensualumni)



[@queensu\\_alumni](https://instagram.com/queensu_alumni)

James Baker, Artsci'93, Meds'95, Anthony Dale, Artsci'92, MPA'95, Brett Young, Artsci'92.

On July 8, at the fourth annual King Wolf Swim, the **Queen's swim team**, old and new, took four of the top six places in the five-kilometre race from the boat launch near Frontenac Park to near the ferry dock on Wolfe Island. Erin Lee, Sc'19, was first overall, followed by Mike Downing, Artsci'91, in second place. Steven Lee, Sc'19, came in fourth, and Mike van de Water, Com'91 (and Mike D.'s teammate from back in the day), came in sixth. Mike D. was first in the wetsuit category, and Erin, Steven, and Mike V. were first, third, and fourth in what they agree is the "non-cheaters" (no wetsuits) category. Mike V., for one, will be back next year, this time to conquer the 10-kilometre race.

**Colleen May Anderson**, Artsci'93, Ed'94, published her first children's picture book, *Silly Sofie*, in April. The book follows Sofie, a puppy, as she meets a colourful array of animal characters. Colleen is a teacher-turned-writer living in Toronto. Learn more: [sillysofie.com](http://sillysofie.com).

**Jennifer Campbell**, MBA'92, encourages her classmates to mark their calendars for Friday, Oct. 13, to celebrate their class's 25-year anniversary in Toronto. For updates, ensure that Smith School of Business has your contact info ([smithalumni@queensu.ca](mailto:smithalumni@queensu.ca)) or contact Jennifer directly at [jen.jon@sympatico.ca](mailto:jen.jon@sympatico.ca).

## Deaths



**Wendy Catherine Avison**, BA'92, died June 4 in Whitehorse, YT, just before her 48th birthday. She had fought brain cancer

and lymphoma for six long years, always believing she could beat these diseases. Wendy leaves her two children, Sonia and Adam Radwanski, in the care of their father, Joseph Radwanski. Wendy is also survived by her children's older brothers, Russell and Christopher Radwanski, whom she raised, her sisters Shannon and Heather, and a myriad of aunts, uncles, cousins, nieces, nephews, and friends

who loved her dearly. She was predeceased by her brother, Scott. Wendy's life was full of joy and laughter in company with her family and friends from coast to coast. She attended public schools in Ottawa, Whitehorse, Regina, and Halifax. While shaped by childhood moves, Wendy wanted to "raise my kids in my home neighbourhood" so in 1993 she packed up her car and returned to Whitehorse, where she found employment in the tourism industry, and later as publications coordinator for Environment Yukon.

## 2000S

### Births



**Peter Bearse**, Artsci'06, Ed'07, NSc'11, and **Kate Bearse** (staff, Queen's Alumni Relations) welcomed their second child, Kara

Elisabeth Grace, on May 23, 2017. She joins her brother, Daniel Elijah Gael, born Aug. 29, 2014.

**Shellee (Rogers)**, Artsci'02, Ed'04, and Ryan MacKay are pleased to announce the birth of Scotia Linda Pearl MacKay on March 16. Mummy, Daddy, and big brother Duncan are all in love with little "Scotty."

### Honours

**Taran Gujral**, Artsci'03, MSc'05, PhD'08 (Pathology), received a 2017

Kimmel Scholar Award from the Sidney Kimmel Foundation. The foundation has provided two-year funding for 15 cancer researchers in the U.S. Taran, who works at the Fred Hutchinson Cancer Research Center in Seattle, was funded for his research "Role of non-canonical Wnt signaling pathway in the tumor microenvironment."



**Greg Wetmore**, Sc'00, has been named one of Ottawa's Top 40 under 40 by the Ottawa Chamber of Commerce and the *Ottawa Business*

*Journal*. Greg is the vice-president of software development for Entrust Datacard and the site leader of the company's Ottawa office, where he oversees 350 employees.

### Job news

**Daniel Clark**, MBA'08, completed his PhD in Entrepreneurship and International Business at Indiana University in May. His research explored how entrepreneurs make the decision to expand internationally. Daniel has accepted a position as assistant professor of entrepreneurship at IE Business School in Madrid.

**Audrey Giles**, Artsci/PHE'01, has been promoted to full professor in the School of Human Kinetics at the University of Ottawa. She is looking forward to spending more time with her dog!

## BETTER LATE THAN NEVER!

**Brian Minns**, Sc'01, and **Meghan Lockington-Minns**, Sc'02, know that it's never too late to share happy news with Queen's friends.

Adelyn, now eight years old, is happy to announce the birth of her little sister Matilda Gail on Aug. 12, 2011. (Yes, she's nearly six). Brian and Meghan live a happy and full life in Toronto, where Brian works in sustainable investing at Addenda Capital and Meghan volunteers in the community. The family visited Kingston in June and

of course needed a picture at the Queen's sign. No pressure, Addie and Tilly, but guess where you're going to university! ■



SUPPLIED PHOTO

## Notes

**Abraham Blair**, Ed'02, MEd'07, has been accepted into the PhD program at the Ontario Institute for Studies in Education (OISE) of U of T. He begins his doctoral studies in September. [blaircity2002@yahoo.com](mailto:blaircity2002@yahoo.com)

**Allison McAuley**, Mus'09, ConEd'10, is co-founder of Gramercy Opera in New York. Gramercy Opera promotes emerging artists through operatic productions performed in non-traditional venues and targeted to non-traditional audiences. In June, the company conducted four sold-out performances of Henry Purcell's *The Fairy Queen* outdoors at Manhattan's Mount Vernon Museum and Garden. Learn more at [gramercyopera.com](http://gramercyopera.com). Allison is the daughter of Frank, Com'78, and Ruth-Anne (Nicholson) McAuley, Artsci'76, Ed'77, and the sister of Mairi McAuley, Artsci'13.

## Deaths

**Lorne B. MacKinnon**, BA'09, died May 18, aged 68, on the water near Picton, Ont. Lorne was a fine musician,



able to play almost any instrument, especially guitar, banjo, and mandolin. He was a parrot aficionado for most of his life. He enjoyed some

retirement years on his boat in Key Largo, Fla., in the winter months and near Belleville during the summer. He will be missed by friends and family for his kindness, humour, and helpfulness to others.

## 2010s

### Births

**Rajesh Lakshmanan**, MBA'14, and his wife, Pradeepa, welcomed Deeraj, a brother for their four-year-old daughter, Deeksha, in November 2016. The family lives in Toronto.

### Job News

**Casey Burgess**, CQEMBA'14, has been promoted to the positions of executive assistant city attorney and chief of

the municipal-regulatory section of the Dallas City Attorney's Office.

**Andrew Lahey**, MBA'10, Law'11, is now at Stikeman Elliott LLP in Toronto, practising in the firm's corporate and securities law department. He returned to Canada from New York City, where he had worked as an M&A attorney at Paul, Weiss, Rifkind, Wharton & Garrison LLP.

**Katherine Wong Too Yen**, Com'12, was recently promoted to a new role as manager of communications and customer care, digital banking, at Equitable Bank in Toronto. In her spare time, she continues to work in the sports industry at theScore; she is in her third year of running its social media platforms.

## Class of 2017

Tell us what's new with you!

Email your news and photos to [review@queensu.ca](mailto:review@queensu.ca).

Your updates will appear in our November issue.



As a Queen's graduate, you are a member of the Queen's University Alumni Association, a global network of more than 150,000 alumni in 154 countries.

This September, your alumni association is hosting events just for you to meet the global alumni network in cities across Canada and around the world (from Toronto to Hong Kong, Calgary to New York, Montreal to Sydney, and more!)

**And don't forget about your Reunion Zero during Homecoming, October 13-15.**

To find an alumni event near you and to register for Reunion Zero, please visit [queensu.ca/alumni](http://queensu.ca/alumni)

Students for a short time... alumni for a lifetime.



QUEEN'S UNIVERSITY  
ALUMNI ASSOCIATION



# We're working hard to drive environmental change.

At Coca-Cola, we've teamed up with WWF to reduce our impact on our planet. By improving energy efficiency across our entire business and introducing Canada's first ever heavy duty hybrid electric trucks, we've reduced our overall carbon footprint by 11% in just two years. As you can see, we're committed to delivering more than just refreshment.

To learn more about what we're doing and why we're doing it, join us at [livepositively.ca](https://www.livepositively.ca)





MICHAEL PAT

## Hong Kong celebrations

On May 20, alumni in the Pan-Pacific region helped celebrate Queen's 175th in Hong Kong. At a special ceremony, retired Justice Kin Kee Pang, Arts'70, LLD'17, received the first Queen's honorary degree conferred outside Canada. That evening, alumni celebrated at a gala dinner at the Ritz-Carlton Hong Kong featuring an address by Nobel Laureate Art McDonald, Professor Emeritus (Physics).

Left to right, Rector Cam Yung, Dean Bill Flanagan (Law), Justice Kin Kee Pang, Arts'70, LLD'17, Chancellor Jim Leech, Principal Daniel Woolf.

## Welcome young alumni

Help welcome the class of 2017 and young alumni (2007–17) with a series of special events at branches around the world this fall. Find an event in your area at [queensu.ca/alumni/YA2017](http://queensu.ca/alumni/YA2017) and help showcase the reach and power of the Queen's global alumni network.

### Canadian events

Toronto  
Ottawa  
Calgary  
Kingston  
Vancouver  
Hamilton-Halton  
Montreal  
London, Ont.  
Sudbury  
Winnipeg

### International events

Hong Kong  
London, U.K.  
San Francisco Bay area  
New York  
Paris  
Boston  
Sydney

## Talking Trump

Professor Kim Nossal (Political Studies) will visit select Canadian branches this fall to talk about the "Trump effect." Nearly a year after his election, what are the impacts of a Trump presidency? Find out at special events in Calgary, Ottawa, Kingston, and Toronto. Visit [queensu.ca/alumni/events](http://queensu.ca/alumni/events) for more information and to register.

## Upcoming events [queensu.ca/alumni/events](http://queensu.ca/alumni/events) [facebook.com/queensualumni](https://facebook.com/queensualumni)

### Boston

#### Oct. 24 – Matariki Network lecture and reception

Join Queen's Provost Benoit-Antoine Bacon as our Matariki Network colleagues from Dartmouth University host a special lecture and alumni reception for partner universities.

### Calgary

#### Nov. 8 – Queen's Law reception

Join us for a reception hosted by Stikeman Elliott LLP, 888 3rd St. SW.

#### Nov. 9 – Johnson Award

Congratulations to Evan Hazell, Sc'81, the 2017 recipient of the Calgary Branch's Johnson Award. Evan is being recognized for his distinguished career in the energy and finance industries and for his contributions to numerous corporate and community organizations.

### Kingston

#### Sept. 23 – School of Rehabilitation Therapy 50th anniversary gala dinner

The evening of nostalgia and festivity celebrates the School of Rehabilitation Therapy's history from 1967 to today. To purchase dinner tickets, visit [rehab.queensu.ca/initiatives/anniversary/gala\\_dinner](http://rehab.queensu.ca/initiatives/anniversary/gala_dinner).

### Sudbury

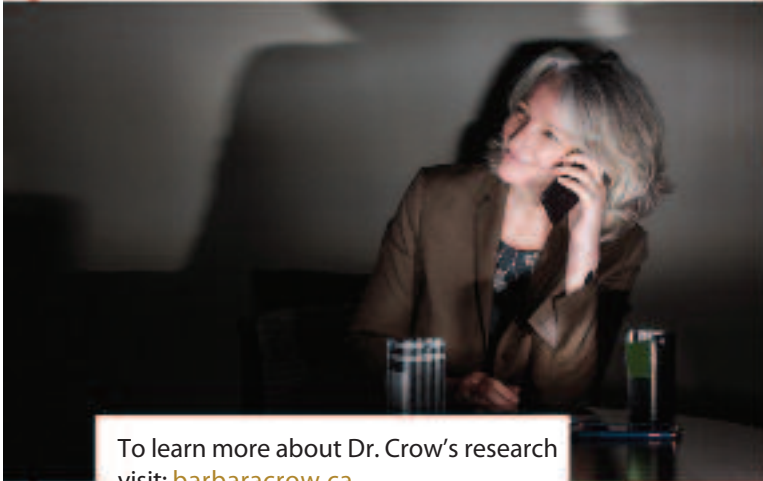
#### Sept. 23 – Players sketch troupe tour

Join in on the fun as we bring the unique Queen's tradition of Players to Sudbury! Purchase your tickets online at [playersto.com](http://playersto.com).

### Nominations open

Nominations are now open for the Ottawa Branch's Agnes Benidickson Award. Visit [queensu.ca/alumni/agnes-benidickson-award](http://queensu.ca/alumni/agnes-benidickson-award) for more information on the award and to make your nomination.

## FACULTY OF Arts and Science



To learn more about Dr. Crow's research visit: [barbaracrow.ca](http://barbaracrow.ca)

To learn more about Dr. Crow's administrative background visit: [QUartsci.com/deancrow](http://QUartsci.com/deancrow)

# a conversation with the new DEAN

*from lifeguard to Dean of  
Arts and Science, an interview  
with Dr. Barbara Crow.*

### **You're new to Queen's, just starting July 1 of this year.**

#### **What were your initial impressions arriving on campus?**

Well, I probably experienced it the same way many of our incoming students do - and how many of our alumni did. The campus is very beautiful, the people have been very welcoming and open. There is a tremendous amount of pride across campus. I was lucky enough to see the campus through student eyes on my first day. The outgoing and incoming Presidents of ASUS were my tour guides. Since then I have seen it through the eyes of faculty and staff and as well, through my own eyes. Together, it really is a beautiful place.

#### **Have you noticed any big differences between your last institution and your first impressions of Queen's?**

First and foremost I noticed the scale. Going from over 50,000 students to 23,000 is really noticeable. It somehow feels more familiar and easier to get to know one another, which seems to perpetuate the amazing loyalty of the Queen's alumni network - unlike anything I have ever seen before. On one hand, we have this amazing 175 year old history rich in stability, but on the other hand, it means we have opportunities in front of us that other institution may have more agility to act on - we need to make sure we keep innovating and moving forward. This is an area I'm very excited to engage within Arts and Science.

And one other notable difference? Instead of a 45-minute drive home from work every day in rush hour, I get to skip home in a few minutes and enjoy the beautiful waterfront. That's a real bonus.



#### **What's the current landscape in higher education from your lens?**

Well, not necessarily a new topic, but a very real and important topic on campuses right now is mental health. At Queen's we are at the forefront with our wellness centre in development, but this is not a topic that can slip from our radar. We have a real responsibility to ensure our staff, faculty and students have the resources they need to be successful here.

Students are also using, and expecting us to use, social and digital media to do tasks that we can not even fathom yet. And as soon as we catch up, they move on to something else. If we can be smart about our use of digital technologies for advising, teaching, and communicating, - we can create a better student experience, save some money, and ultimately be the main driver for our own long-term success.

#### **At the end of your five-year term what do you hope your legacy will be?**

I believe in making a measurable impact. Our students, staff, faculty and arts and science alumni should be able to say 'Yes, I've seen a difference.' The three areas at the top of my list are: 1. a real change in how we think and how we act about diversity, equity and inclusivity. The work on this has already started - which is fantastic, but we still have far to go; 2. enhancing the graduate student experience. Queen's is an undergraduate student powerhouse - from recruitment to retention, we excel. I would like to see us showing great strides towards having a name in the graduate student market similar to our reputable standing in undergraduate education; and, 3. I've been impressed with the cross-faculty and cross-unit collaborations so far, but would like to facilitate more of these academic and administrative collaborations. It's an exciting time to be here.

# The student-alumni connection

While most of us are still enjoying the days of summer, many of our students are eager to begin another school year and return to our beautiful campus. As you know, Queen's is known not only for the exceptional education it offers but also for its outstanding "out of the classroom" experiences and the many extra-curricular activities it provides.

One of the groups on campus is the Queen's Student Alumni Association (QSAA), with whom the QUAA board of directors works quite closely. Some of you may know the group as STAR (Student Team on Alumni Relations), which started in 1986. The mission of the QSAA is simple: to prepare students for success by connecting them to their future lives as engaged Queen's alumni. The QSAA is led by student volunteers from all faculties who make up the executive board, leadership team, and ambassadors. We are delighted to have international student Max Garcia, Comp'17, serve as this year's QSAA president. You will find Max and the QSAA ambassadors at many of our QUAA branch events, so next time you attend one, please make sure to connect with them.



OFFICE OF ADVANCEMENT

The QSAA encourages students to maintain a strong, spirited connection to the Queen's community by transitioning them into engaged alumni. They do this through several initiatives presented throughout the school year. The Alumni Speaker Events series offers students the opportunity to hear from and network with Queen's alumni. "QYourFuture" helps fourth-year students prepare for life after graduation, with resumé writing and LinkedIn workshops as well as soft skills workshops in networking and business dining etiquette. And then there are the fantastic "GOLD" panels, where recent alumni – "Gaels of the Last Decade" – are brought back to discuss their experiences after graduation. If you are interested in helping with any of these programs, I encourage you to get in touch through Max at [QSAA.President@queensu.ca](mailto:QSAA.President@queensu.ca).

The QSAA students are also important partners in educating our students and alumni about the impact of philanthropy and fostering the next generation of giving to Queen's, through an initiative known as "Tricolour Giving." The annual Tricolour Giving initiative starts at each Homecoming: both students and alumni are invited to vote for a part of campus that the QSAA will support financially that year. Recent recipients include the Ban Righ Centre and the AMS Food Bank. I am tremendously proud of the QSAA members, the work they are doing around giving, and the incredible leadership they are showing in this area. Along with the QUAA board, the QSAA team has achieved 100 per cent participation in giving for a number of years in a row.

If you are planning to attend Homecoming this year, I encourage you to stop by the QSAA spirit corner, speak to one of the ambassadors, and hear about the wonderful work they are doing and the initiatives they are supporting. You can even cast a vote for the Tricolour Giving initiative!

And finally, to those reading the *Review* as our newest members of the QUAA – the class of 2017 – congratulations on your recent graduation and welcome to your alumni association! There are many benefits to being a member and many connections to be made through the QUAA – I invite you to join us through our social media channels or check us out at [queensu.ca/alumni/](http://queensu.ca/alumni/).

*Cha ghéill!*

■ **Sue Bates**, Artsci'91  
Volunteer President,  
Queen's University Alumni Association  
✉ [QUAA.President@queensu.ca](mailto:QUAA.President@queensu.ca)  
🐦 [@QUAAPresident](https://twitter.com/QUAAPresident)

# marketplace

To place your ad, email [advert@queensu.ca](mailto:advert@queensu.ca)



**marjorie COOKE**  
SALES REPRESENTATIVE

ALWAYS A WISE CHOICE!  
**COOKE**  
[cookekingston.com](http://cookekingston.com)

**613.453.2067**  
[marjorie@cookekingston.com](mailto:marjorie@cookekingston.com)  
ACCREDITED SENIOR AGENT

80 Queen St, Kingston, ON T 613.544.4141 F 613.548.3830

**ROYAL LEPAGE**  
PROALLIANCE REALTY BROKERAGE  
INDEPENDENTLY OWNED AND OPERATED

## REAL ESTATE

**Ottawa Real Estate.** Buying or selling in the nation's capital? Let me put my 30 years experience to work for you! References gladly provided. Jeff Rosebrugh, ArtsSci'81, Sales Representative, Royal LePage Performance Realty. Toll free 1.877.757.7386. [jeff@jannyjeffandshan.com](mailto:jeff@jannyjeffandshan.com). [www.jannyjeffandshan.com](http://www.jannyjeffandshan.com).

## TRAVEL/VACATION RENTALS

**Rainforest Ecolodge** in south Pacific Costa Rica owned and operated by Maureen (Sc'81) and John (Sc'78) Paterson. 10% off for Queen's Alumni. [info@riomagnolia.com](mailto:info@riomagnolia.com), [www.riomagnolia.com](http://www.riomagnolia.com)

## MARKETPLACE AD

**INFORMATION** Classified-style and small display ad placements available. Ad sizes are flexible. Please contact the Advertising Coordinator for further information. [advert@queensu.ca](mailto:advert@queensu.ca)



Queen's Commerce '89  
Queen's Football Hall of Fame  
Over 22 Years Award Winning Experience  
Instructor Ontario Real Estate College  
Professor School of Business, St. Lawrence College  
Investment, Residential, Waterfront, Condos

**RANDY ZARICHNY**  
Broker, 613-532-1789  
[zarichny@kingston.net](mailto:zarichny@kingston.net), [randyzarichny.ca](http://randyzarichny.ca)

**ROYAL LEPAGE**  
ProAlliance Realty Brokerage  
80 Queen Street T: 613-544-4141  
Kingston, ON F: 613-548-3830



Paper or digital?  
**Your choice.**

Email [review.updates@queensu.ca](mailto:review.updates@queensu.ca) if you want to change your subscription preference or your address, or download the app from your app store.



**@SHOP** Get your official Gaels gear at the Q-SHOP

Shop online [qshop.ca](http://qshop.ca)

# EX *libris* **New books by faculty and alumni**

“The evening’s last light has drained out of the sky behind the procession of dead hotels lining the beach. Up to fifteen storeys high, they were built so close together that now, their facades darkening, they merge into a single jagged silhouette, like the remains of an immense seawall or ancient coastal fortification. You can barely make out the rusted fence topped with barbed wire that separates the beach from the hotels and the ghost city behind them.”



This is an excerpt from *The Nightingale won't let you sleep*, by **Steven Heighton**, Artsci'85, MA'86. It is a passionate tale of buried secrets, the repercussions of war, and finding love in the ruins. Elias Trifanis is desperate to belong somewhere. To make his dying father happy, he joins the military – but in Afghanistan, by the time he realizes his last-minute bid for connection was a mistake, it is too late, and tragedy ensues. The novel follows Elias's flight from Afghanistan to Cyprus to Varosha, an abandoned Greek-Cypriot resort town that turns out not to be the refuge he had sought.

**Robert Alvo**, Artsci'81 (Biology), is the author of *Being a Bird in North America*, a book 12 years in the making. “For each species,” writes Mr. Alvo, a conservation biologist, “I pick out of the literature its most interesting aspects, and combine an authoritative species account written for the layperson with a cartoon.” The book offers insight into the lives of birds, revealing the tricks they use to survive and the conservation issues they face. Learn more at [babina.ca](http://babina.ca).

**Elizabeth Milroy**, Artsci'77 (Art History), is the author of *The Grid and the River: Philadelphia's Green Places, 1682–1876*. Focusing on the history and representation of Philadelphia's green spaces, and making use of a wealth of primary source materials, she offers insights into the city's political and cultural development and documents how changing attitudes toward the natural environment affected the physical appearance of Philadelphia's landscape and the lives of its inhabitants. Dr. Milroy is professor and department head, Art and Art History, at Antoinette Westphal College of Media Arts & Design at Drexel University in Philadelphia.

**G.W. Stephen Brodsky**, Arts'69 (MA, Victoria, DPhil, York, U.K.), is the author of *Joseph Conrad's Polish Soul: Realms of Memory and Self*. Born into a Polish *szlachta* (noble) family, the novelist Joseph Conrad maintained, even in exile, strong ties to his Polish heritage and culture. Yet the author earned renown by writing in English, often about nautical adventures in remote parts of the world. In this work, Dr. Brodsky seeks to reclaim the essentially Polish sensibility of Conrad's groundbreaking oeuvre. He finds in Conrad's work a distinct Polonism that plays intriguingly with selfhood, freedom, and irony.

**Carolyn Harris**, MA'07, PhD'12 (History), has a new book: *Raising Royalty: 1000 Years of Royal Parenting*. The book examines 20 sets of royal parents, from King Edgar the Peaceable of England and his queen, Elfrida, to William and Kate today. The book explores how the public has always been fascinated by royal parenting and judged royalty according to the parenting standards of the day.

**Beverly Rasporich**, Arts'62, a Canadian Studies scholar and professor emerita at the University of Calgary, is the author of *Made-in-Canada Humour: Literary, Folk and Popular Culture*. The book includes celebrated Canadian writers and poets with ironic and satiric perspectives; oral storytellers of tall tales in the country and the city; newspaper print humorists; representative national and regional cartoonists; and comedians of stage, radio, and television. Dr. Rasporich lives with her husband, historian Anthony Rasporich, Arts'62, in Invermere, B.C.

**Julie Salverson**, Artsci'77, is the author of *Lines of Flight: An Atomic Memoir*. When the author discovers a link between Canada's north and the atomic bombs that fell on Japan, she starts a 10-year journey that connects uranium, radiation, trauma, and resilience in unexpected ways. From a village outside Toronto to Great Bear Lake in the Northwest Territories and on to Hiroshima, she traces the radioactive trail. The book strives to answer some of the key questions of life in the 21st century: how do we live in, and think about, this terribly beautiful world? Dr. Salverson is an associate professor at the Dan School of Drama and Music at Queen's.



**kingston**  
**WRITERSfest**  
A FESTIVAL FOR WRITERS AND READERS  
**September 27 to October 1, 2017**  
Holiday Inn Kingston Waterfront  
**Tickets on sale now!**

[kingstonwritersfest.ca](http://kingstonwritersfest.ca)  
#KWF17 @ KWF17





“A walnut cost me \$1,500.”

### Avoid out-of-pocket expenses with affordable Alumni Health & Dental Plans.

Small things (like a bit of walnut shell breaking a tooth) can add up to big expenses. And if you're not covered by an employer's health and dental plan? The costs can come straight out of your pocket.

Help protect yourself with Alumni Health & Dental Plans, offered through Manulife. With plenty of coverage options plus competitive rates, it's easy to find a plan that's right for you. Choose plans for dental and vision care, prescription drugs, massage therapy, chiropractic and a lot more. Start saving on both routine and unexpected healthcare expenses.

**Get a quote today. Call 1-866-842-5757 or visit us at [manulife.com/queensu](http://manulife.com/queensu).**



ALUMNI AFFINITY PARTNER



Underwritten by

**The Manufacturers Life Insurance Company.**

Manulife and the Block Design are trademarks of The Manufacturers Life Insurance Company and are used by it, and by its affiliates under licence. © 2017 The Manufacturers Life Insurance Company (Manulife). All rights reserved. Manulife, PO Box 4213, Stn A, Toronto, ON M5W 5M3.





## TD Insurance

Meloche Monnex



Take advantage of your alumni privileges.

Get preferred rates and coverage that fits your needs.

You could **save big\*** when you combine your alumni preferred rates and bundle your home and car insurance.

Proudly Supporting



QUEEN'S ALUMNI

### Supporting you ... and Queen's University.

As a Queen's University graduate, you have access to the TD Insurance Meloche Monnex program. This means you can get preferred insurance rates on a wide range of home and car coverage that can be customized for your needs.

For over 65 years, TD Insurance has been helping Canadians find quality home and car insurance solutions.

Feel confident your home and car coverage fits your needs. Get a quote now.

HOME | CAR

Get a quote and see how much you could save!

Call 1-888-589-5656

Or, go to [tdinsurance.com/queensualumni](http://tdinsurance.com/queensualumni)

