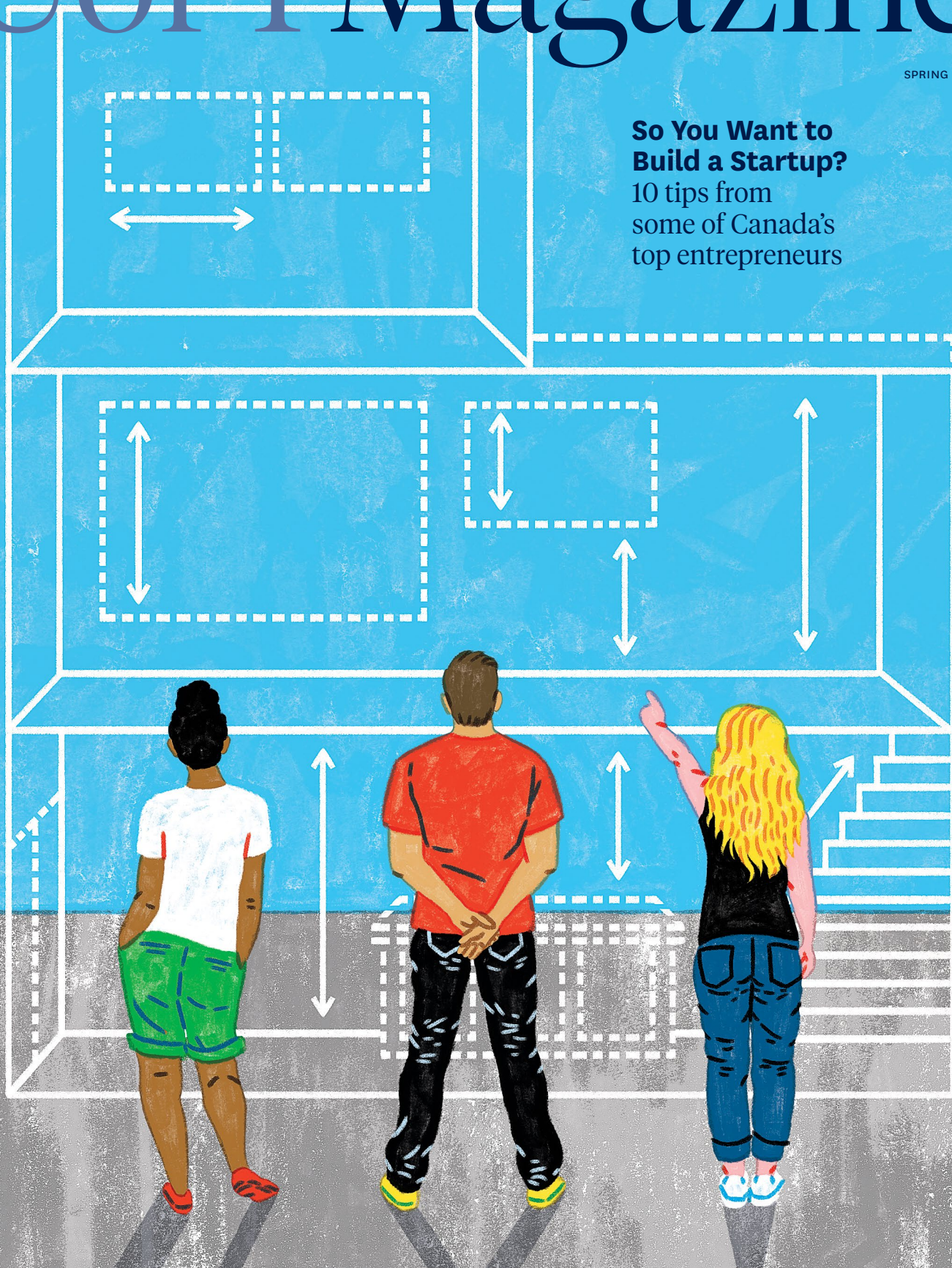


Warrior for Peace Physicist Ursula Franklin / **Living without Lungs** A surgical first / **Sidewalk Saloon** Toronto's piano man
Lost Words Languages at risk / **A Stronger Net?** Testing a guaranteed income / **Zooming In** A revolutionary microscope

UofT Magazine

SPRING 2017

**So You Want to
Build a Startup?**
10 tips from
some of Canada's
top entrepreneurs



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Spring 2017

Volume 44, No. 3

Former U of T engineering professor Ursula Franklin, who died last year, spent a lifetime using her science, and her voice, to work toward peace



46 Warrior for Peace

U of T physicist Ursula Franklin staunchly opposed weapons of mass destruction. As Cold War tensions rise, her work remains as relevant as ever

BY STACEY GIBSON

28 So You Want to Build a Startup?

Lessons in innovation from some of U of T's – and Canada's – top entrepreneurs

BY MARCIA KAYE, JOHN LORINC AND SCOTT ANDERSON

38 Lost Words

Dozens of Indigenous languages in Canada are in danger of disappearing. What will it take to save them?

BY NIKKI WIART

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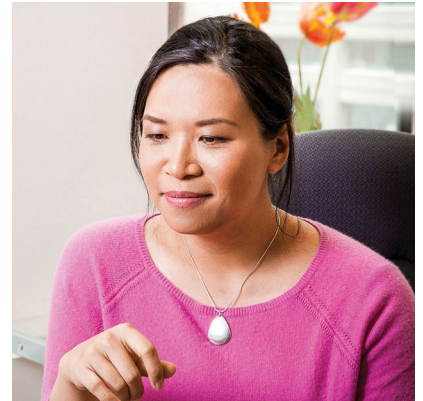
Departments

On paper, I work for U of T. But in my heart, I work for our languages – and for our people

– Ryan DeCaire, who learned Kanien'kéha (Mohawk) in his early 20s and now teaches it at U of T's Centre for Indigenous Studies (p. 40)



12 A U of T team gobbled up second place in an inter-university Iron Chef competition



54 How alumna Margaret Lam aims to reduce ticket prices for concertgoers



23 Can a minimum income guarantee help lift people out of poverty? Ontario is about to find out

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Letters



If we rely too heavily on machines to examine precedents and recommend solutions, will we lose our ability to make reasoned analysis on our own?

PAUL OSTIC

BSC 1989 VICTORIA, GATINEAU, QUEBEC

The Good News Review

Reading in the Winter 2017 issue about the amazing work being done by U of T researchers and innovators who have a passion for helping others – and who dedicate their lives to making the world a better place – is inspiring, to say the least. In a world where the media spew mainly bad news and constantly remind us of all the things we need to be concerned about, I consider *U of T Magazine* my “good news review.” It lifts my spirits and reminds me of the wonderful things that are possible when people have access to education and are encouraged to reach their potential and realize their dreams.

REV. MARION LOREE

MDIV 2007, GUELPH, ONTARIO

A Downside to AI?

While reading your article about Blue J Legal and its artificial intelligence (AI) software for lawyers (Winter 2017), I began to wonder whether this was really a good idea. If we rely too heavily on machines to examine precedents and recommend solutions, will we lose the ability to make reasoned analysis on our own? Will reliance on AI-recommended solutions slow our adaptation to changing social conditions?

Decision-support models are typically validated by their ability to reproduce past decisions. They assume that the foundation (laws, regulations, societal

expectations, etc.) is static. Use of the model will then repeat the same decisions and can stifle innovation and new thinking.

In reality, the foundation is dynamic and new analysis may be required as we adapt to new laws or to changing societal expectations. For example, will AI models help us to adapt to the changing balance between public security (where the state might have access to significant amounts of personal information) and the protection of personal privacy? Or will they hinder us?

If we continue to challenge, refine and review AI models and tools with the same degree of rigour as we do other theories and models, then my questions should be addressed. I applaud the U of T team that brought together legal, software and business communities to develop a new tool. But let it be used wisely.

PAUL OSTIC

BSC 1989 VICTORIA, GATINEAU, QUEBEC

Benjamin Alarie, CEO of Blue J Legal,

responds: Our AI legal tools promote legal transparency and access to justice. The genius of the common law is that impartial judges decide cases on their relative merits and produce public reasons. The value of what we’re doing is that we are operationalizing the cumulative wisdom of these judges for the benefit of those who seek to comply

with and follow the law. Too many cases are now brought to court that would have been settled if only the mutual distrust of the litigants had been overcome. With the benefit of our tools, increased rates of settlement will leave judges with more time to focus on the truly borderline cases. This will allow for an improved articulation of the boundaries of the law. Everyone will benefit.

Unsung Hero

Thank you for the terrific article on Jim Delaney (“In Memoriam,” Winter 2017). I first met Jim through student politics in the mid-1980s and interacted with him again in the mid-1990s, when I sat on the board of the U of T Alumni Association and he was working at Simcoe Hall. To me, Jim was emblematic of U of T’s many unsung staff heroes – the people who focus on the students and help make the university great.

FRANK MACGRATH

TORONTO

Hockey Trailblazers

Thanks for the great picture of the women hockey players (“Ice Queens,” Winter 2017). Can you imagine playing hockey in those long and full skirts? In my study on American women’s entry into sports and the clothing they wore for it, U of T was the only school I came across (granted, the only Canadian school I looked at) that had hockey in any form, even as a club. Way to go, Toronto!

PATRICIA CAMPBELL WARNER

BA 1958 VICTORIA, BELCHERTOWN, MASSACHUSETTS

Write to us!

U of T Magazine welcomes letters at uoft.magazine@utoronto.ca.

What You Were Reading*

A Bold Vision for Front Campus Moves Closer to Reality

The English of a Millennium Ago

The Class of 2020

A New Sense of Community at SGS

Oxford Bound

*Top 5 stories from the Winter 2017 issue, ranked by number of website views



What You Told Us You Liked*

A Bold Vision for Front Campus Moves Closer to Reality

“My Education Enabled Me to Break Down Walls”

Exploring Toronto’s Tamil Heritage

In Memoriam: Jim Delaney

The Sweet Sound of Inspiration

*Top 5 stories from the Winter 2017 issue, ranked by number of Facebook likes



Share This!

U of T Magazine stories published only at magazine.utoronto.ca/blogs.

10 Things You Probably Didn't Know Were Invented by U of T Alumni



There are definitely some surprises on this list.

U of T's 190th Birthday Quiz!



Test your knowledge of all things U of T!

Can Science Help You Find a Soulmate?



Instant Chemistry, a company founded by two U of T grads, is using DNA testing to help couples get together – and stay together. Alumni **Sara Seabrooke** and **Ron Gonzalez** provide couples who use their company's service with a relationship “road map” and a compatibility score out of 100.

Instagram for Doctors



Figure 1, co-founded in 2013 by alumnus **Gregory Levey**, allows medical practitioners to share patient images, including X-rays and CT scans, with the app's worldwide community of one million health-care professionals. The app allows multiple doctors to offer opinions on a case and deliver patients a quicker diagnosis.

Hail to the Chef!



She may have won out against all the other cooks on MasterChef Canada to take the competition's \$100,000 top prize, but alumna **Mary Berg** has a surprising kryptonite in the kitchen. “I am truly terrible at cooking rice,” she says. “I’m so thankful it never came up in the competition.”

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EVERY ALUM HAS A STORY. TELL US YOURS.

Peng Fu has done a lot since he graduated from U of T. He founded a life-sciences investment firm that helped launch two technology companies in its first year. One day he'll return to his studies of the bluegill sunfish but for now Peng devotes his energy to innovation incubators.

Peng is making an impact and U of T alumni everywhere are doing the same. He's part of something bigger and it's time to share that story with the world. Under the direction of an expert panel—led by Professor Shiri Breznitz, an economic geographer at the Munk School of Global Affairs, and Professor Vivek Goel, Vice-President, Research and Innovation—our first-ever Alumni Impact Survey will measure the global contributions of our alumni to tell a deeper story about us all.

Learn more and take
the Alumni Impact Survey
at uoftimpactsurvey.ca



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or visit www.library.utoronto.ca/support**

BOUNDLESS



The True Impact of U of T

Help us measure the immense contributions our alumni make to their communities by participating in our first-ever Alumni Impact Survey



Great universities are defined in large part by the achievements of their alumni, and U of T is fortunate to have incredibly accomplished graduates around the world, in every walk of life.

But while we know the individual stories of many of our former students, we know very little about how our alumni *collectively* are contributing to their communities. And so, this spring, we've embarked on a mission to find out – by seeking information from every single one of the university's more than 500,000 living graduates.

It's our hope that by creating a clear picture of the scope and scale of our alumni's activities, we will better understand the impact of the *entire* University of Toronto community in the Toronto region, Canada and the world.

We already have a good sense of the university's contributions to research, teaching and the economy. U of T consistently ranks among the top 25 universities – and top 10 public institutions – in the world. We employ 23,000 people across our three campuses, and our faculty members and graduate students attract \$1.1 billion in research funding each year. Over the past two years alone, 48 companies have been spun out of U of T research and hundreds of inventions have been developed here throughout the university's history. In all, U of T's annual economic contribution to Canada is estimated at \$15.7 billion.

But these numbers – as impressive as they are – don't reflect the immense impact of our alumni. It is this part of the U of T story that we would like to tell more fully.

By now, many of you will have received an email asking you to participate in a 15-minute Alumni Impact Survey. The invitation comes from Malatest, a market research company we have engaged to assist with the project.

The survey includes specific questions about your employment and civic engagement. It asks whether you have started a company, received any patents, published a book, served on a board or spent time volunteering. There will also be space for you to tell us about activities that we may not have listed. Are you a caregiver or a coach, for example?

Do you help out at your local church, synagogue or mosque? Humility may be a virtue, but we ask you to suppress your modesty! The whole point is for us to be able to document your accomplishments fully and accurately.

We are treating this survey as an academic undertaking. The analysis will be rigorous, and all individual answers will be kept private and secure, unless we receive your express consent to share them. Our own internal team, led by Shiri Breznitz, a professor of economic geography at the Munk School of Global Affairs, and Vivek Goel, vice-president, research and innovation, guided the development of the survey and will help analyze the results. Later this year, we will share what we have learned with the entire university community.

Other top-ranked universities have conducted similar surveys, so we'll be able to compare our results with those from Harvard, Stanford and MIT, to name a few. This will be a significant asset as we seek to enhance U of T's international reputation and attract the world's best students, researchers and teachers to the university. At a time when other countries are turning inward, U of T has a unique recruitment opportunity as a beacon of diversity and inclusion.

Knowing more about your contributions will further strengthen U of T's reputation locally, nationally and globally, which in turn will heighten the value of a U of T degree. This will serve both the university and its individual alumni in mutually beneficial ways. It will also help us in our ongoing conversation with policy-makers and taxpayers about the value of public investments in post-secondary education.

The Alumni Impact Survey presents a rare opportunity for us to learn more about *your* story and to reveal the true and profound value of a University of Toronto education. We hope you'll be inspired to take part.

Sincerely,
Meric Gertler

If you wish to participate in the Alumni Impact Survey but haven't received an email inviting you to do so, please visit: UofTimpactsurvey.ca

Calendar

MORE EVENTS!
Check out the latest
campus happenings at
utoronto.ca.



Shaker for Young Alumni
at the Metro Toronto Zoo,
Spring Reunion 2016

MAY 31 TO JUNE 4

Spring Reunion 2017

If you graduated in a year ending in a 2 or a 7, please visit the Spring Reunion website to learn more about the events hosted in your honour by your college, faculty or department, as well as U of T-wide celebrations. While honoured alumni are special guests, all U of T alumni are welcome. Events include the LGBTQ Spring Soiree, the Chancellor's Circle Medal Ceremony, the U of T Alumni Celebration, the Front Campus Barbecue and Spring Shaker for Young Alumni – a night of mixing and mingling for recent grads at Canada's Wonderland. More Spring Reunion events are listed on page 9.

Contact **1-888-738-8876**, **416-978-5881** or spring.reunion@utoronto.ca, or visit springreunion.utoronto.ca.

Alumni

April 26

Paris, France

Jazz, Wine and Cheese with the University of Toronto Paris Jazz Trio. Free. 7:30 p.m. 7 Rue Bridaine. Register at alumni.utoronto.ca/events/regional.

May 1

**University College
Senior Alumni Association Annual
General Meeting.** Rev. Mark

MacDonald delivers a talk on Indigenous Christianity. Reception to follow. Free, but registration is required. Online and mail-in registration available soon. For more

information: 416-978-0544 or senior.alumni@utoronto.ca.

May 11

Washington, D.C.
**Presentation on Transit and
Gentrification in D.C. and Toronto,** featuring urban studies professor Charles Hostovsky. Free. 6:30–

8:30 p.m. Martin Luther King Jr. Memorial Library, 901 G St. NW. Register at alumni.utoronto.ca/events/regional.

May 13

Vancouver

**Alumni and Friends Brunch and
VanDusen Botanical Garden Tour.**

Have brunch and explore VanDusen Botanical Garden. Price TBA.

11:30 a.m.–3:30 p.m. 5251 Oak St. Register at alumni.utoronto.ca/events/regional.

June 15

Vancouver

**Alumni and Friends Patio Pub
Night.** Come celebrate patio

season. Enjoy conversation and refreshments with fellow University of Toronto graduates. Free. 6–8 p.m. Tap and Barrel, Olympic Village, 1 Athletes Way. Please register at alumni.utoronto.ca/events/regional.

Explore the university through a child's eyes at Kids' Passport to U of T, during Spring Reunion, June 3



Spring Reunion

May 31

Canada's Wonderland

Spring Shaker for Young Alumni.

Recent U of T grads take over Canada's Wonderland for a private party with exclusive access to 14 rides. Price TBA. 7–10 p.m. 1 Canada's Wonderland Dr. 1-888-738-8876, 416-978-5881 or spring.reunion@utoronto.ca.

June 1

Location TBA

LGBTQ Spring Soiree.

Pre-Pride party for all LGBTQ alumni. Free. 6–9 p.m. Location TBA. 1-888-738-8876, 416-978-5881 or spring.reunion@utoronto.ca.

June 1

Sidney Smith Hall

Stress-Free Degree Lectures.

Attend lectures by U of T professors and instructors without worrying about homework or exams (see back cover). Free. 6:15–7:15 p.m. 100 St. George St. 1-888-738-8876, 416-978-5881 or spring.reunion@utoronto.ca.

June 2

Convocation Hall

Chancellor's Circle Medal

Ceremony honouring alumni marking their 55th, 60th, 65th, 70th, 75th and 80th anniversaries. Free. 9:30–11 a.m., with reception afterward. Registration: 9 a.m. 31 King's College Circle. 1-888-738-8876, 416-978-5881 or spring.reunion@utoronto.ca.

June 2

Convocation Hall

50th Anniversary Ceremony

honouring 1967 grads. Free. 1:30–3 p.m., with reception afterward. Registration: 9 a.m. 31 King's College Circle. 1-888-738-8878 or spring.reunion@utoronto.ca.

June 2

Sidney Smith Hall

Stress-Free Degree Lectures.

Attend lectures by U of T professors

and instructors without worrying about homework or exams (see back cover). Free. 12–1 p.m., 3:15–4:15 p.m., and 6:15–7:15 p.m. 100 St. George St. 1-888-738-8876, 416-978-5881 or spring.reunion@utoronto.ca.

June 3

Various departments/faculties on St. George Campus

Kids' Passport to U of T. Travel around U of T to different departments, buildings and labs to do cool things, and see what it's like to attend Canada's top university. Free. 9:30 a.m.–12:30 p.m. 31 King's College Circle. 1-888-738-8876, 416-978-5881 or spring.reunion@utoronto.ca.

June 3

Sidney Smith Hall

Stress-Free Degree Lectures.

Attend lectures by U of T professors and instructors without worrying about homework or exams (see back cover). Free. 9:45–10:45 a.m., 2:30–3:30 p.m. and 3:45–4:45 p.m. 100 St. George St. 1-888-738-8876, 416-978-5881 or spring.reunion@utoronto.ca.

June 3

St. George Campus

Campus Bus Tours. Free. Every hour from 10 a.m.–3 p.m. with a break 12–1 p.m. Bus departs from Knox College, 59 St. George St. 1-888-738-8876, 416-978-5881 or spring.reunion@utoronto.ca.

June 3

Convocation Hall

U of T Alumni Celebration, sponsored by the U of T Alumni Association. Keynote speaker address and the annual general meeting. All alumni welcome. Free. 11 a.m.–12:30 p.m. 31 King's College Circle. 1-888-738-8876 or 416-978-5881 or spring.reunion@utoronto.ca.

June 3

Front Campus

Alumni BBQ to celebrate with your

fellow alumni, family and friends. All alumni welcome. Free. 12:30–2:30 p.m. King's College Circle. 1-888-738-8876, 416-978-5881 or spring.reunion@utoronto.ca.

Please read about more Spring Reunion events at springreunion.utoronto.ca.

Exhibitions

To September 9

Thomas Fisher Rare Book Library

Struggle and Story: Canada in

Print. In celebration of Canada's 150th anniversary. Free. Mon. to Fri., 9 a.m.–5 p.m., Thurs. to 8 p.m. (during term). 120 St. George St. 416-978-5285.

April 28 to May 24

Hart House

Canada by Treaty: Histories of a

Negotiated Place. Launch of exhibit on the long history of treaty making, and how and why these agreements were essential to the foundation of modern Canada. Curated by Indigenous Studies student James Bird, and professors Laurie Bertram and Heidi Bohaker. Free. 4–6 p.m. 7 Hart House Circle. history.utoronto.ca/Canada150.

Lectures and Symposia

April 29 to 30

Department of Philosophy

Annual Conference in the History

of Metaphysics: Time. Eight specialists will discuss conceptions of time in the history of philosophy. Free. 170 St. George St. 416-978-3313 or karolina.hubner@utoronto.ca.

May 3

Chestnut Residence and

Conference Centre

Institute of Medical Science

Scientific Day 2017. Showcase of current student and faculty research, with a keynote address by Dr. Marina Picciotto: "Vaping and the Baby Brain – What Can Studies

of Nicotine Tell Us About Brain Development?" Free. 8 a.m.–5 p.m. 89 Chestnut St. ims.utoronto.ca/event/ims-scientific-day-2017-save-the-date.

May 11

Rehabilitation Sciences Building

Springing into Action: Running

Injury Prevention Tips with Skate Canada physiotherapist Agnes Makowski. \$11 (\$5 for students/seniors). 5:30–7 p.m. 500 University Ave, Rm 140. Register at physicaltherapy.utoronto.ca/forms/rsvp-springing-into-action.

May 31

The Royal Conservatory, Toronto

Dalla Lana School of Public Health's **Dean's Leadership Series:** How Can Public Health Reinvent Itself to Meet Tomorrow's Global Challenges? Free. Lecture: 5:30–7 p.m. Reception: 7–8 p.m. Koerner Hall, 273 Bloor St. W. 416-946-7521, communications.dlsph@utoronto.ca or dlsph.utoronto.ca/event/deans-leadership-series.

June 1

Metro Toronto Convention

Centre

This Molecular World: From the

Depths of the Earth to Infectious

Disease. An event during the 100th Canadian Chemistry Conference and Exhibition, featuring talks by U of T profs Barbara Sherwood Lollar, Gilbert Walker, Aaron Wheeler and others. Free. 5–7 p.m. 255 Front St. W. Rm 107. csc2017.ca.

Sports

June 8

Goldring Centre

U of T Sports Hall of Fame

Induction Ceremony.

Featuring the 2017 inductees, including a member of the 1928 Olympic gold hockey team for Canada. \$40 (free for children 12 and under). 6–9 p.m. 100 Devonshire Pl. 416-946-5126, rachel.keeling@utoronto.ca, halloffame.utoronto.ca.

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alumnitravel.utoronto.ca

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BOUNDLESS

Life on Campus

“Filter brainwaves to allow us to communicate with people unable to speak”

What Twitter user
@john7istheman wishes
AI could do right now
p.16



Prof. Raquel Urtasun (second from right) talks about her AI research with (from left) Minister of Finance Bill Morneau, Premier Kathleen Wynne, Mayor John Tory and U of T president Meric Gertler

A Revolution in Artificial Intelligence

Toronto's Vector Institute aims to attract the world's leading minds in a booming field

A NEW INSTITUTE IS STAKING Toronto's and Canada's claim as the global leader in artificial intelligence – and a team of globally renowned U of T researchers helped create it.

Geoffrey Hinton, a University Professor emeritus in computer science at U of T and vice-president, Google Fellow, at Google, will serve as the chief scientific adviser of the Vector Institute – officially announced on March 30 – based in downtown Toronto.

The independent, non-profit institute, affiliated with U of T, will work with other universities and the private sector to attract the world's leading minds in artificial intelligence and push toward the next made-in-Canada breakthroughs.

“The University of Toronto has long been considered a global leader in artificial intelligence research,” says U of T president Meric Gertler. “It's wonderful to see that expertise act as an anchor to bring together researchers, government >



IN CASE YOU MISSED IT

Student Chefs Do Battle

Tasty appetizer earns U of T second place in international cooking competition



This year's Iron Chef contest took place at U of T

IN FEBRUARY, three U of T students got a chance to let their foodie flags fly: they took part in the annual Inter-University Student Iron Chef Competition, hosted at U of T for the first time. U of T executive chef James Piggott coached students Felipe Branco, Brettany Colette and Jordan Su in preparation for the high-pressure cook-off against teams from McGill University, University of Ottawa and University of Massachusetts Amherst.

On competition day, each team was given two-and-a-half hours to create an appetizer and a main course, incorporating ingredients that had only been revealed to them the night before. The U of T team's main dish, an Indian-styled ramen, fell a bit short on flavour, according to the judging panel – but their gravlax (a cured salmon) drew unanimous praise, earning them the best appetizer prize.

Overall, the U of T chefs placed a close second behind UMass Amherst, the defending champions. "I'm very proud of my team," says Colette. "They've taught me a lot, and I'm grateful for the experience."

– SALLY CHOI

➤ and private sector actors through the Vector Institute, enabling them to aim even higher in leading advancements in this fast-growing, critical field."

After decades of being on the "lunatic fringe" pursuing an area of AI known as neural networks, Hinton, his colleagues and former students are now part of an incredibly in-demand "lunatic core." Everyone is vying for their talents, from universities to AI startups to the giants of Silicon Valley. South of the border, U of T alumni and former faculty can be found leading AI divisions at Google, Apple and Facebook. Here at home, they're creating startups such as Layer6 AI, WinterLight Labs and Deep Genomics, fuelling local demand for the same talent pool.

Hence the need for the Vector Institute.

The goal, the researchers say, is to have Vector serve as a magnet to attract and retain talent – including a large number of PhD students – to support AI startups and show that Toronto is serious about capitalizing on its reputation as a global leader in deep learning.

"If we don't create this now, basically we're going to miss the boat in the revolution of AI. It's actually critical for this to [have] started yesterday," says U of T computer science

professor Raquel Urtasun, the Canada Research Chair in Machine Learning and Computer Vision. Urtasun is globally in demand for her work on self-driving cars – an important area of research at the Vector Institute.

The creation of Vector couldn't have come at a more important time. Toronto and Canada are currently at the forefront of AI, but many countries are racing to take the lead. Vector will share \$125 million in federal funding with fellow institutes in Montreal and Edmonton. The Province of Ontario will invest \$50 million, and more than 30 top Canadian and global companies are set to contribute up to \$80 million. The institute will also work closely with other Ontario universities with AI talent.

"I think in the next 10 to 20 years almost all aspects of Canadian society will be impacted by artificial intelligence from farming to medicine to education," says Brendan Frey, a U of T professor in electrical and computer engineering and founder of AI startup Deep Genomics. "Artificial intelligence is the best way to interpret data and then make rational, good choices...You can think of AI as a pervasive technology that's going to make life better across the board in all aspects of society." – JENNIFER ROBINSON



From left: Elder Andrew Wesley, Provost Cheryl Regehr, President Meric Gertler

Action for Indigenous People

University aims to hire more Indigenous faculty and staff, recruit more students

THE UNIVERSITY OF TORONTO will hire more Indigenous faculty and staff and bolster efforts to recruit Indigenous students as part of what it acknowledges is an “overdue initiative” to expand the university’s Indigenous community. President Meric Gertler and Vice-President and Provost Cheryl Regehr made the commitment earlier this year in response to the final report of U of T’s Truth and Reconciliation Steering Committee, which called on the university to take action in several areas related to Indigenous peoples.

Entitled “Wecheehetowin,” which means “working together” in Cree, the report highlights that the work to be done at U of T will be a collective journey. “Creating this report was a process focused on inclusivity and engagement,” says Jonathan Hamilton-Diabo, co-ordinator of U of T’s Council of Aboriginal Initiatives and co-chair of the committee. “There was a strong emphasis on incorporating a wide range of voices from both the university and the broader community.”

The document includes 34 short-term and longer-term calls to action, grouped into six topics. Among them: to create more Indigenous spaces on all three campuses; to recruit more Indigenous faculty and staff; to add Indigenous content to the curriculum in all academic divisions; to give greater consideration to Indigenous communities in research; to investigate and remove barriers to access for Indigenous students; to create an Indigenous Advisory Council to monitor progress on these goals and to engage in fundraising to support them.

U of T will also hire a director of Indigenous initiatives specifically to work on implementing the committee’s recommendations, the provost announced.

Elder Andrew Wesley, one of two elders who advised the committee in its deliberations, presented the report to Gertler and Regehr at a ceremony at Hart House in January. Gertler and Regehr established the committee in early 2016 in response to the federal Truth and Reconciliation Commission.

“The University of Toronto acknowledges its responsibility in contributing to the plight of Indigenous peoples, and we embrace the opportunity to engage with Indigenous communities and, together, lead the process of reconciliation,” said Gertler, who noted that this work is particularly important as the university and the country mark the 150th anniversary of Canada’s Confederation.

Hamilton-Diabo, who is also director of Aboriginal student services at First Nations House, says U of T’s response to Truth and Reconciliation is an evolving process. “Now we have the opportunity to engage a larger audience, expand available resources and involve the Indigenous community in developing plans as we grow the Indigenous presence on campus.”

Keeping the momentum going is important, Hamilton-Diabo adds. “While there is a lot of work to be done, there is also the opportunity for tremendous growth. And as we move through this journey, there is a great sense of hope and a positive energy of what’s to come.” – **RACHEL HALPERN**

NAMECHECK ICUBE UTM



ICUBE UTM is a business accelerator that helps early-stage startups develop their ideas. The name (as in I³) refers to inspiration, ideation and innovation – three “i” words that are central to entrepreneurship. It was suggested by U of T Mississauga student Nour Montasser, who won a contest to name the facility.

Located at UTM’s cube-like Innovation Complex, the accelerator is open to UTM students, staff, faculty and alumni and members of the local community. Those accepted into

ICUBE gain access to mentors, workspace and entrepreneurship workshops.

Since its launch in 2015, ICUBE has accepted more than 50 ventures. As well, hundreds of people have taken part in ICUBE workshops and an entrepreneurial boot camp, or have signed up to receive startup advice. “The campus has hundreds of entrepreneurs looking for a place to call home,” says Samuel Dumcum, ICUBE’s program co-ordinator. For more information, visit icubeutm.ca. – **SALLY CHOI**

Encountering Ntshingwayo kaMahole (1879)

Our murderous cries
throttled appallingly the wind,
as we lurched to sodden—
but surprise—
Slaughter,
as kaMahole's pitch-skin tribe pitched us down,
and their fist-gripped *iklwa*—
a thrusting spear—
gusted through each thudding heart.

Bright, British corpses attracted
a vulturous infiltration.
There was damage. There was dirt.

Percussive exclamations smacked our ears.
Howls caked, moans drizzled,
wherever Zulu *assegai*—
that long, throwing-spear—
homered,
in itinerant downpours.

Our troop shattered like the altercations
of breakers versus boulders,
so that each tiding line
assumed a turbulent edge—
the choreography of crabs—
as we whites leapt, scurried, scuttled,
or stopped short,
our guts pouring out,
our brains chopped out.

No unbroken dust on the *veldt*.
Green turned wet, voluptuous lavender.
The pasture was no better than a toilet.

Our soldiery—now plastic muck,
yield shreds of self to vultures' beaks.



GEORGE ELLIOTT CLARKE is the inaugural E.J. Pratt Professor of Canadian Literature at U of T. He has won the Governor-General's Award for Poetry, the National Magazine Gold Medal for Poetry and the Pierre Elliott Trudeau Fellowship Prize. He is Canada's Parliamentary Poet Laureate. "Encountering Ntshingwayo kaMahole (1879)" is included in the collection *Canticles I (MMXVII)*.

U of T Gains Global Edge

Applications from several countries soar as international students rethink where to attend university

LAST YEAR'S BREXIT VOTE and the election of Donald Trump in the U.S. are changing the complex calculus for many foreign students about how to choose a university abroad. And it appears Canada – and U of T – will benefit.

Ted Sargent, U of T's vice-president, international, recently noted that applications from U.S. students to U of T had jumped 80 per cent over the same period last year. Students from several other countries, including Mexico and India, are also applying in much greater numbers. "They want to be part of an institution that values diversity and is interested in creating a global classroom that's inclusive of people from around the world," says Sargent.

Over the last two years, U of T has stepped up its U.S. recruitment efforts by increasing the number of school visits, developing communications materials specifically for the U.S. market, and holding a growing number of events in major

centres such as Washington and New York City. (This past March, Lorne Michaels [BA 1966 UC], the creator and executive producer of *Saturday Night Live*, spoke to prospective U of T students at a recruitment event in New York.)

American students currently make up just five per cent of U of T's international student population. But with 135 million Americans living within a one-hour flight of Toronto, Sargent sees the U.S. as a large potential growth market.

U of T's two biggest selling points for international students continue to be its excellent reputation for teaching and research and the employability of its graduates, says Sargent. He consistently highlights both qualities as he works to raise U of T's profile across the globe, build partnerships with other leading institutions and create more international learning experiences for U of T students.

In the current international political climate, Toronto's reputation for being open to other cultures is giving U of T an additional edge, he says – among students, but also among researchers and faculty. "I think there are going to be opportunities at all levels," he says. "Getting the best undergraduate students is the key priority, but getting the best graduate students, post-doctoral fellows and faculty members is also crucially important to our mission."

– SHARON ASCHAIK

WHAT'S THE POWER
OF GIVING LIGHT TO
A BILLION PEOPLE?



UNIVERSITY OF
TORONTO

BOUNDLESS



Canada is ranked third among the world's most entrepreneurial countries, according to the 2017 Global Entrepreneurship Index. The U.S. placed first and Switzerland second



Open, Playful Student Commons on the Way

With construction expected to begin this spring on U of T's Student Commons, plans are being finalized for an interior that's open, playful and accessible to an ever-changing student body, says U of T planner David Sasaki.

"It's going to look like a student space and a workspace. We're incredibly excited to see it come to fruition," says U of T Students' Union (UTSU) president Jasmine Wong Denike. The UTSU has been working with Students for Barrier-Free Access to ensure the building is accessible. When the facility opens, in 2018, it will include two elevators and a

computer lab equipped with adaptive technology. Located at the corner of Huron and College streets, the building will also contain club offices, multi-purpose rooms that students will be able to reserve, a kitchen and an expanded copy centre. UTSU groups (such as Bike Chain), which are currently scattered across the St. George campus, will now all be located in one place, which will be open 24-7. "I think it's essential for our students to know that whatever time they're on campus, there is a welcome and safe space for them," says UTSU executive director Tka Pinnock. - **SALLY CHOI**

SOUND BITES

What do you wish artificial intelligence could do for you?

Filter brainwaves to allow us to communicate with people unable to speak.

@John71stheman

Perform all the hard, taxing labour that makes actual people suffer.

@tigerbano

Fix my Windows 10 computer.

@BookerHal

AI should be inclusive and not kill me because of my intellectual inferiority.

@phasor

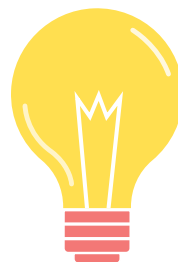
Join the conversation at twitter.com/uoftmagazine.

Poll | Does the idea of starting your own business appeal to you?

Like many U of T students who are interested in starting their own business, Xinyi Zhao - who is in her second year of an MBA at the Rotman School of Management - foresees greater career satisfaction in building her own company than in working for someone else's.

For Khadija Waseem, a third-year Rotman commerce student, the appeal in an entrepreneurial venture is that it allows "you so much autonomy and creativity."

Students who said "no" to the idea of starting their own business typically cited the higher risks involved. Candace Gunn, a fourth-year student, says she would prefer the staff support more commonly found in established companies. - **SALLY CHOI**



**52%
Yes**



**29%
No**



**19%
Not now,
maybe later**

This highly unscientific poll of 100 U of T students was conducted on the St. George campus in February.

You That I Loved

You that I loved all my life long,
you are not the one.
You that I followed, my line or path or way,
that I followed singing, and you
earth and air of the world the way went through,
and you who stood around it so it could be
the way, you forests and cities,
you deer and opossums struck by the lonely hunter
and left decaying, you paralyzed obese ones
who sat on a falling porch in a deep green holler
and observed me, your bald dog barking,
as I stumbled past in a hurry along my line,
you are not the one.

But you
are the one, you that I loved all my life long,
you I still love so in my dying mind
I grasp me loving you when we are gone.
You are the one, you path or way or line
that winds beside the house where she and I live on,
still longing though long gone
for the health of all forests and cities,
and one day to visit them,
one day be rich and free enough to go and see
the restricted wonders of the earth.
And you are the one, old ladies fated from birth
to ugliness, obesity and dearth,
who sat beside my path
one day as I flashed by. And you are the one,
all tumble-down shacks in disregarded hills
and animals the car on the road kills
and leaves stinking in the sun.



ALBERT MORITZ is the Goldring Professor of the Arts and Society at Victoria College. "You That I Loved," is included in his collection *The Sentinel*, which won the 2009 Griffin Poetry Prize.

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IN MEMORIAM

Rose Wolfe

Former chancellor remembered for her wit and warmth

“I WILL MISS HER.” This sentiment, more than any other, is what members of the U of T community expressed to me following the death of Rose Wolfe last December at age 100.

That, and understandably high praise for her contributions to the university. She served on Governing Council in the 1970s and as U of T’s chancellor from 1991 to 1997, graduating 60,000 students on her watch – including one who was terminally ill and whose degree Wolfe presented in the hospital. She also endowed the Rose and Ray Wolfe Chair in Holocaust Studies and set up scholarships, including one for indigenous students.

But those four little words – “I will miss her” – invariably came up in interviews with people who crossed her path, testifying to her ability to transform what might have been merely a cordial professional relationship into something more.

Born the third of five children to Romanian immigrants who owned and lived behind a small bakery in Kensington Market, Wolfe earned a BA in sociology in 1938 and a social work diploma in 1939, both from U of T. “My parents sold bread for five cents a loaf,” she once told *U of T News*. “We never knew how they managed to put us through university.”

The next year, she married Ray Wolfe, a young man she called the neighborhood’s “most eligible bachelor;” he became a produce wholesaler, and his work ethic was as strong as hers. One of her first jobs had her placing Jewish children who had survived the Holocaust in Canadian homes. They were, she recalled, “undersized, pale and withdrawn” and they inspired her to commit to a life of service, pouring her always considerable energy into a variety of hands-on and leadership positions in charitable, arts and education organizations.

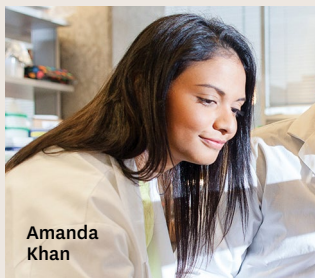
“When I was dean of social work, Rose would politely tell me where she thought we could do things better,” says Cheryl Regehr, now U of T’s provost. “You appreciated it, this elegant, forceful woman paying attention. I will miss her.”

Prof. Donald Ainslie, principal of University College, says: “She helped me understand the particular role that University College, with its non-denominational history, has played for Jewish students. The students always loved her Hanukkah parties. They felt she was on their side. I’ll miss spending time with her – her wit, her perspective.”

Prof. Anna Shternshis, the director of the Anne Tanenbaum Centre for Jewish Studies, also says she valued Wolfe’s feedback on the centre’s work and her willingness to show up for events. “Rose advocated for integrity, for female leadership in academia, for Yiddish. We made plans to see each other in early January. I do not want to think of a year without Rose Wolfe in it.”

Wolfe’s husband, Ray, predeceased her in 1990. She is survived by her son Jonathan, daughter Elizabeth and four grandchildren. Several of the children she placed in Canadian homes in the 1940s attended her funeral. – **ALEC SCOTT**

People



Amanda Khan

U of T MD/PhD student **Amanda Khan** has been named one of Canada’s Most Powerful Women. She joins other members of the U of T community on the Women’s Executive Network list for 2016, including Rotman School of Management professor **Beatrix Dart**, RBC board chair **Kathleen Taylor** (BA 1980 St. Michael’s) and **Marilynn Booth** (MScN 1981), the former dean of the School of Continuing Studies.

The province of Ontario has appointed U of T president **Meric Gertler** to the board of Waterfront Toronto, a public agency that aims to enhance community engagement, boost economic activity and provide more public

space along Toronto’s waterfront.

Prof. **Cristina Amon** has been reappointed dean of the Faculty of Applied Science and Engineering for a third term, ending June 2019. Beginning in July, Amon will also serve for a year as adviser to U of T provost Cheryl Regehr on matters related to women in science, technology, engineering and math.

Geoffrey Hinton, a University Professor in computer science, has received the BBVA Foundation Frontiers Award in information and communications technology for his “pioneering and highly influential work” to endow machines with the ability to learn.



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Leading Edge

“I was shocked to find this incredible, untapped reserve hiding in plain sight”

Stephen Brophy, a student at the Daniels Faculty of Architecture, Landscape, and Design, on reimagining Toronto's ravines

p. 26



U of T Doctors Keep Patient Alive Without Lungs for Six Days

The procedure allowed Melissa Benoit to have a life-saving transplant

WHEN MELISSA BENOIT woke up in hospital and learned she'd spent six days without lungs, she was stunned. "That blew my mind," says the 33-year-old registered nurse from Burlington, Ontario. "I knew it was impossible for somebody to live without lungs. It made no sense."

Benoit is believed to be the first in the world to undergo such a procedure. "We knew it was theoretically possible," says Shaf Keshavjee, a U of T professor of thoracic surgery and the lead surgeon at Benoit's operations. "But could a patient actually survive very long? That wasn't entirely clear."

The experimental procedure was a last-ditch attempt to save Benoit's life. Born with cystic fibrosis, which affects the lungs and is the most common fatal genetic disease in young adults, Benoit had been battling H1N1 influenza. Then she contracted *pseudomonas*, a deadly bacterial infection. She quickly spiralled down into septic shock. Her blood pressure and oxygen levels plummeted. A lung transplant wasn't an option at that point because having such severe sepsis made her ineligible. "We were very sure that if we didn't do something radical, she would die that day," says Niall Ferguson, a U of T professor of medicine and the head of critical care at the University Health Network (UHN).

While there was careful deliberation among the medical team before attempting the untried, her family was keen to proceed. Her husband, Chris, her parents and other relatives all agreed Benoit would grab any chance at life – especially in order to watch her two-year-old daughter, Olivia, grow up.

The initial operation took a 13-member team nine hours. ▶



In 2016, U of T's Citizen Lab detected malware that, if activated, would have turned a human rights activist's iPhone into a "digital spy." Apple immediately released a security update in response

➤ “Lungs are normally soft and spongy, but hers were so filled with infection they were as hard as footballs,” says Keshavjee, who is also director of the Toronto Lung Transplant Program at Toronto General Hospital, part of UHN. Benoit was hooked up to two sophisticated cardiopulmonary life-support devices. One pumped blood out of her large veins, through an oxygenator and back into her aorta; the other served as the lung for the right side of her heart to pump through. “We were obsessive about maintaining blood pressure and oxygen levels to protect her brain,” Ferguson says. Within hours her condition stabilized. Although sedated and supported by the lung devices, Benoit was now eligible for a transplant. Six days later, donor lungs became available, and she underwent a successful five-hour surgery.

Benoit's recovery has been, and still is, a long road. With her new lungs she can take glorious deep breaths without triggering the violent, rib-cracking coughing spells of the past. But, after more than three months' immobility in critical care, she needed extensive physiotherapy to walk again. She takes many pills each day, including anti-rejection and anti-infection drugs. With cystic fibrosis-related diabetes and damaged kidneys, she's on an insulin pump and dialysis and may undergo a kidney transplant, with her mom as donor.

But she's full of gratitude for the dedicated professionals – and the deceased donor – who gave her her life back. She encourages everyone to register for organ donation at beadonor.ca. Tearing up, she says, “I wanted to present my story to the world because if there's another family out there that has run out of hope, my experience might offer them a possibility.”

Could this procedure become routine? “It's still very, very high-risk,” says Keshavjee, “but now we know it's possible.” - **MARCIA KAYE**

Data Minding

A mathematician offers ideas on how to protect ourselves from hackers without making our digital devices impossibly complex to use



AS HACKERS use increasingly sophisticated tools to break into computer systems and interconnected smart devices, a U of T professor is working to improve security while urging people to take digital privacy more seriously.

“The biggest threat is that technology is moving so fast, and convenience is what most people are concerned about,” says Kumar Murty, chair of U of T's math department. “Security systems are designed to be used. And if they are inconvenient, people are not going to use them.”

Murty says even the strongest digital security encryption can be easily sidestepped if people carelessly display their passwords on sticky notes attached to their computer, or system designers inadvertently make it too easy for hackers to gain access.

He cites the example of a 2013 cyberattack on Target, the department store chain, in which a hacker was able to steal customer credit card information. It happened because the company's information technology framework was porous, allowing someone with access to a less secure part of the network to get into other – more secure – parts without additional authentication.

It's why the digital security research cluster at U of T's planned new Centre for Applied Mathematics aims not only to create the next generation of data integrity and encryption systems, but also work with the public and private sectors on good security practices. Murty currently heads the GANITA lab at U of T, which has already developed math-based security technology that is being commercialized by startups PerfectCloud and Prata Technologies.

Digital security is one of six clusters initially planned for the centre, including financial risk management, big data, transport, imaging and fluids research. - **PETER BOISSEAU**

LINGO

Woke



If you're a regular Twitter user, you may have noticed people describing themselves as *woke*, or advising others to *stay woke*. To be woke, says Cassandra Lord, a professor of historical studies and of women and gender studies at U of T Mississauga, is to be

conscious of the racial and social inequities experienced by black people – in the past and today. The term has been used widely by the Black Lives Matter movement, and emerges from African-American vernacular as a call to action, she says.

While the term has taken on a life of its own outside of black communities, Lord says those who use it are typically demanding an examination of power and privilege, and a commitment to dismantling systemic forms of anti-black racism. - **STAFF**



This year, Finland became the first country in Europe to test a universal basic income, providing 2,000 unemployed citizens with a monthly income of 560 euros, or 780 Canadian dollars



the province expends considerable resources tracking clients' efforts to find jobs. If they do land a job – even a low-paying one – chances are they'll see a big cut in benefits. According to Segal, this actually discourages people from looking for work. The programs also have not reduced poverty rates in Ontario, which have been stagnant – between 12 and 15 per cent – since the 1990s.

Segal's approach is much simpler: filing a tax return would automatically trigger a "no-strings-attached" cash grant for anyone whose income falls below the poverty line. Less of the money earned above the \$1,320 would be clawed back, providing a greater incentive for claimants to work, says Segal. The proposed program is far easier to administer, less paternalistic and allows people to spend their money as they choose, he adds. Individuals would also get a more generous

basic income under his proposal: a single mother on Ontario Works currently gets about \$970 a month.

For the pilot, a random sample of adults living under the poverty line will receive a basic income for three years and their experiences will be compared to others on existing support programs. The goal is to track whether participants are more likely to eat better, be healthy, invest in education and work more. The key for any benefits program is "to support low-income individuals while still providing incentives to work, if they are able," says Dwayne Benjamin, the chair of U of T's economics department.

Basic income guarantees were first proposed in the U.S. in the 1960s as a means of dealing with inner-city poverty. Decades later, in response to rising inequality, increasing automation and the growing precariousness of the labour market, governments have again begun to consider variations of a basic income guarantee. Apart from Ontario, the Finnish government and cities in Holland and Scotland are exploring the idea.

Some critics argue that unconditionally handing people money may prompt them to work less. Others suggest that a basic income alone – without broader access to higher education and a living wage – is unlikely to reduce poverty. But findings from basic income trials in Namibia and India show positive effects on health and educational outcomes, although results have been mixed on work rates.

While the evidence may not be conclusive, the Ontario pilot "highlights the value of social experiments in informing public policy," says Benjamin. "That the government would commit themselves to be directly informed by research is really the exciting part." – **MANINI SHEKER**

THE BIG IDEA

A Stronger Safety Net

Can a minimum income guarantee help lift people out of poverty? Ontario is about to find out

IN MOST DEMOCRATIC COUNTRIES, governments redistribute wealth from the rich to the poor, with the goal of creating a more just and equitable society. But how much wealth should be redistributed – and what's the best way to do it? In Canada, the provinces have created a patchwork of programs to support the unemployed and others with low incomes, but there's little agreement on the best approach.

Now an old idea is gaining new traction: a basic income guarantee. And Hugh Segal, the master of Massey College, is a leading proponent. This year, the Ontario government is expected to launch a three-year pilot program – designed by Segal – to test the idea. The concept is simple: every adult up to the age of 65 living under the poverty line is guaranteed tax-free earnings of up to \$1,320 a month (or 75 per cent of the poverty line), regardless of whether they have a job. Those with disabilities would receive an additional \$500.

If the pilot is successful, the basic income guarantee would replace Ontario Works and the Ontario Disability Support Program. Both provide eligible adults with financial assistance for basic needs and job counselling – but demonstrating and maintaining eligibility is a complicated process. And because recipients must actively seek employment to receive benefits,



U of T contributed an estimated \$15.7 billion to the Canadian economy in 2015

Q&A

The Value of a University

How much do U of T alumni contribute to Toronto, Canada and the world?

Shiri Breznitz

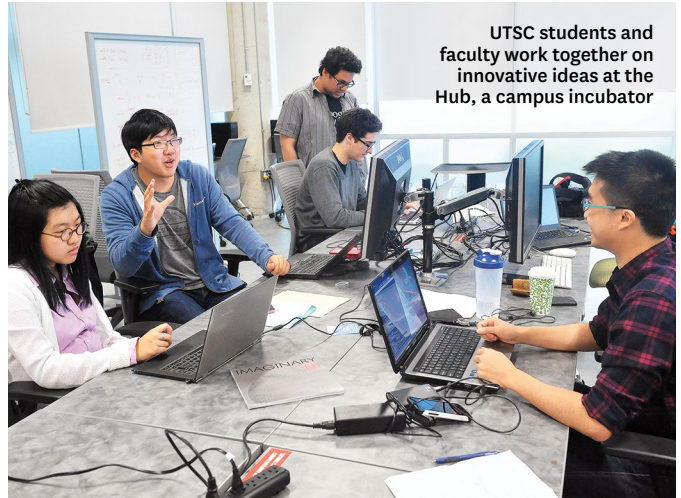


The question of how much societies benefit from universities intrigues **Shiri Breznitz**, a professor at the Munk School of Global Affairs who studies university-led innovation and economic development. This spring, she will be advising on a U of T survey that seeks to measure the university's impact through its more than 500,000 alumni around the world. She recently spoke about the project, and innovation at universities more broadly, with *U of T Magazine* editor **Scott Anderson**.

When you look at a university's contributions to a region, you distinguish between short term and long term. Why? The short-term contributions are the actual dollars that flow into a region due to the university's presence – employee salaries, for example, and purchases such as office space and campus food. Outside funds such as donations, grants and government financial support are also considered in determining a university's economic impact.

In the long term, we seek to measure the future income of graduates and the employment and revenues of companies spun out of university research. We tend to focus on the commercialization of knowledge because it's easier to quantify. When a technology developed at U of T is sold or licensed to a company, the university gets royalties. If a spinout company from U of T employs 20 people, we know roughly what this is worth. But even these measures account for only a small proportion of the long-term impact of a university. We also need to measure the value of volunteer work by faculty, students and alumni, the value of free public lectures, which happen almost every day at U of T – and much more. The Alumni Impact Survey I'm working on will address some of these questions and provide a far better picture of how important U of T is to the Toronto region, the province and the country.

Why are alumni responses to the survey so important? There are two reasons: One, universities receive public funding, so they need to be able to demonstrate the extent of their



UTSC students and faculty work together on innovative ideas at the Hub, a campus incubator

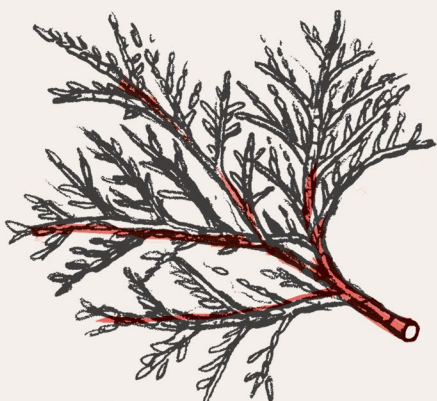
societal contribution. Second, we want to show our alumni how valuable their U of T degree is. I moved here from the U.S., and I find Canadians are shy about touting their achievements. This survey is about sharing the collective story of U of T alumni and demonstrating how well they've done. It's an important story.

You noted that commercializing knowledge is a long-term contribution from universities that's often quantified.

How effective is U of T at this? U of T can compete with any of the world's top research universities on technology transfer and commercialization. What's unique about U of T is its approach to entrepreneurship. It is clear from studies that you can't just say, "OK, we're going to do entrepreneurship now." You need to make organizational change to allow for it and you need to teach it. U of T is doing both. U of T has entrepreneurship champions who promote it across the university. Students and faculty who want to try out a business idea or learn about entrepreneurship can do so easily and in any field. The university supports entrepreneurship teaching, business acceleration and liaison with industry.

Some think faculty should pursue their research interests completely unencumbered by the concerns of business while others believe they should pursue more research with clear applications. Which camp do you belong to? I definitely believe in the basic research approach. Most of the disruptive technologies that have come out of universities have come from basic research questions. You need to allow people to explore the unknown. This is how you discover something totally new.

To find out more about U of T's Alumni Impact Survey, please visit UofTimpactsurvey.ca.



a wake

Your eyes open the night's slow static at a loss
to explain this place you've returned to from above;
cedar along a broken shore, twisting in a wake of fog.

I've lived in rooms with others, of no place and no mind
trying to bind a self inside the contagion of words while
your eyes open the night's slow static. At a loss

to understand all that I cannot say, as if you came
upon the infinite simply by thinking and it was
a shore of broken cedar twisting in a wake of fog.

If I moan from an animal throat it is in hope you
will return to me what I lost learning to speak.
Your eyes open the night's slow static at a loss

to ever know the true terminus of doubt, the limits of skin.
As long as you hold me I am doubled from without and within:
a wake of fog unbroken, a shore of twisted cedar.

I will press myself into potential, into your breath,
and maybe what was lost will return in sleep once I see
your eyes open into the night's slow static, at a loss.
Broken on a shore of cedar. We twist in a wake of fog.

Excerpted from *The Infinite Citizen of the Shaking Tent* by Liz Howard. Copyright © 2015 by Liz Howard. Published by McClelland & Stewart, a division of Penguin Random House Canada Limited. Reproduced by arrangement with the Publisher. All rights reserved.

ossuary IX

what can I say about the storms,
the suns, the evenings, the moons
which have left the skies

the clouds' soft aggressions,
the seas leadening,
to brilliant slate

what is left of the winds' hoarse hands,
eclipsed by farms, the latitudes
hulahooped to the bottom of the stratospheres

the floors of oceans raked with backhoes,
the sea beds gutted,
the sheets of coral ripped by toenails of trawlers

the human skin translucent with diesel,
the lemon trees' inadvertent existences,
the satellite whales, GPS necklaces of dolphins and turtles

what can I say truly about the lungs alveoli
of plastic ornaments,
erupting, without oxygen

Excerpted from *Ossuaries* by Dionne Brand. Copyright © 2010 by Dionne Brand. Reprinted by permission of McClelland & Stewart, a division of Penguin Random House Canada Limited.



"a wake" appears in **LIZ HOWARD's** (BSc 2007 New College) poetry collection *Infinite Citizen of the Shaking Tent*, which won the 2016 Griffin Poetry Prize and was a finalist for the 2015 Governor General's Award for Poetry.

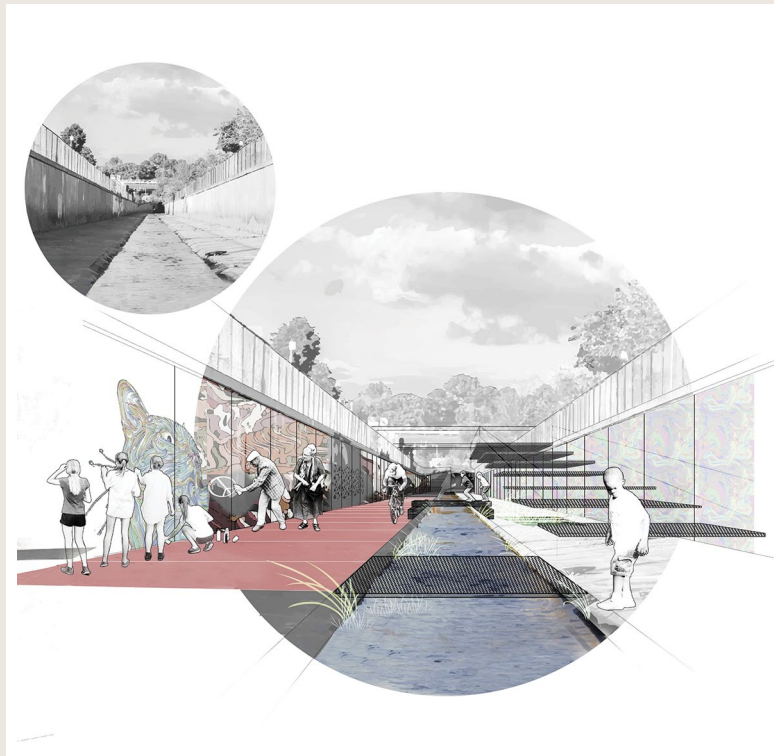


Ossuaries, a poetry collection by **DIONNE BRAND** (BA 1975 UTM, MA 1998), won the 2011 Griffin Poetry Prize. Her previous collections have won the Governor General's Award for Poetry, the Trillium Book Award and the Pat Lowther Memorial Award. She teaches at the University of Guelph.



Smaller creeks in downtown Toronto, such as Garrison Creek and Taddle Creek, have been almost completely bricked over and now run deep under the city centre

Reimagining Toronto's Ravines



Newfoundland native Stephen Brophy, a third-year master's student at the Daniels Faculty of Architecture, Landscape, and Design, remembers the moment he discovered Toronto's ravines. "I was shocked to find this incredible, untapped reserve hiding in plain sight," he says.

Last fall, as part of his studies, Brophy, along with other Daniels students, was asked to come up with ideas for underused sections of Toronto's river valleys. The goal: to tap into the ravines' potential as a public resource.

Brophy examined an unappealing 3.5-kilometre stretch of Black Creek Channel that, as he describes it, is "almost completely encased in concrete." His proposal redesigns the channel as a multi-purpose trail along one side, turns a wall into a "canvas" for public art, allows for skateboarding and provides new entry points for greater public access. He suggests carving out an amphitheatre that could be used for community events and school gatherings, but which would also serve to mitigate floodwaters. Brophy hopes his ideas restore "dignity to a marginalized river and its neighbourhood."

Prof. Alissa North, who taught the course, says she wanted students to rethink the ravines in light of the city's aging infrastructure, the need for flood protection and the growing number of people downtown seeking outdoor recreation. City planning staff offered feedback on the students' projects and will get copies to keep, she says. - SCOTT ANDERSON

Revealing the True You

New model for assessing personality traits could benefit employers

A NEW MODEL for identifying personality traits may help employers save money by enabling them to better predict how an individual will perform on the job.

The model, developed by Brian Connelly, a professor of management at U of T Scarborough, and Samuel McAbee of the Illinois Institute of Technology, is unique in that it contrasts personality as seen by an individual versus how their personality is seen by others.

Two problems with self-reported personality tests are that they rely on people to be self-aware and to tell the truth about themselves. Asked if they are hard-working, some job applicants will say "yes" because they really are hard-working. Other applicants *think* they're hard-working but aren't, while others exaggerate because they want to give a good

impression. By using peer assessments, an employer can determine which applicants are providing the most accurate information and which are the most self-aware.

"If someone believes they are more outgoing or friendlier than they actually are based on peer assessment, that's important information to have about that person," says Connelly.

Connelly's model uses a unique blend of self and peer ratings to gather feedback on an individual's relationship to the big five personality traits – extroversion, agreeableness, conscientiousness, neuroticism and openness. What sets it apart from previous models is that it provides a robust way to determine whether there's agreement or divergence between the self and peer ratings.

Connelly says more reliable personality tests will do a better job of weeding out bias and fakery that cost organizations millions of dollars in retention and hiring costs every year.

"In general," says Connelly, "we know that people who are more conscientious tend to do better no matter what the job is. With the other four traits, it depends more on the particular job. In customer service, for example, agreeableness comes more into play." - DON CAMPBELL

EVERY ALUM HAS A STORY. TELL US YOURS.

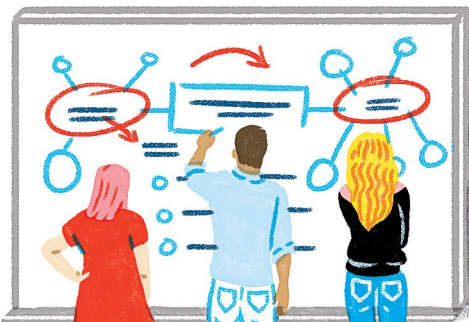
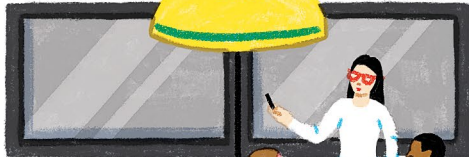
Sana Halwani is an intellectual property lawyer and a U of T grad. She became a Canadian citizen in Grade 7 and is a proud metrics geek. She's learning how to canoe and volunteers for causes close to her heart. Right now she's advocating for diversity at the Federal Court.

Sana is making an impact and U of T alumni everywhere are doing the same. She's part of something bigger and it's time to share that story with the world. Under the direction of an expert panel—led by Professor Shiri Breznitz, an economic geographer at the Munk School of Global Affairs, and Professor Vivek Goel, Vice-President, Research and Innovation—our first-ever Alumni Impact Survey will measure the global contributions of our alumni to tell a deeper story about us all.

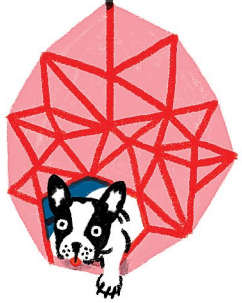
**Learn more and take
the Alumni Impact Survey
at uoftimpactsurvey.ca**



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HAPPEN



Hello!





By **Marcia Kaye**, **John Lorinc**
and **Scott Anderson**
Illustrations by **Katie Carey**

So You Want to Build a Startup?

10 tips from
some of
Canada's top
entrepreneurs



ONLY HALF OF new Canadian companies survive past five years, and only a tiny percentage become global success stories.

Tiff Macklem, the dean of the Rotman School of Management, has been thinking and writing a lot about how to improve these odds. He doesn't believe Canadians are lacking in education or innovative ideas. But he does think we have a problem *converting* ideas into products and services that people – lots of people – want.

Where is Canada's answer to Spotify (the music streaming service first heard in Sweden) or Skype (founded in Estonia)? "The crux of our problem is commercialization and scale," Macklem says. In his view, what Canadian startups are missing is great business judgment, which, as he points out, is not easy to acquire: "A new venture cannot simply go downtown and purchase a unit of business judgment," he says.

To address this, the U of T Entrepreneurship network of incubators, accelerators and programs, including the Rotman School's, are connecting fledgling companies with expert mentors to provide the kind of hands-on advice they'll need to get through those perilous first few years – and, with any luck, eventually compete on a global scale. For this feature on startups, we asked several of U of T's – and some of Canada's – top entrepreneurs to share a lesson they learned on the path to success.



No. 1

As an entrepreneur, the best product you can build is yourself



In the early days of Wattpad, Allen Lau had everything under control. He and co-founder Ivan Yuen had come up with the idea, developed the technology and written the code. They now waited for readers and writers to flock to it and advertising revenue to pour in. It took a while. That first year, 2006, Wattpad had barely a thousand users.

Over the next couple of years, however, interest grew and so did the company.

But Lau discovered that while he was proficient on the technology side, in other skills – marketing and publicity, raising capital – he was less competent. Or as he puts it, “I was horrible! I realized that if I wanted to scale the company, I had to scale myself.” In other words, quickly acquire new skills with each phase of the company’s growth.

When Wattpad needed more employees, Lau suddenly had to learn through trial

Allen Lau (BASc 1991, MASc 1992) is the CEO and co-founder of Wattpad, an online story-sharing community with 45 million monthly users.

and error how to hire people, then how to delegate. When the company required more than one engineer or marketer, he needed to hire team leaders, which meant he had to become a leader himself. “And that’s a very different skill set.”

Approaching investors required different expertise again. “When I approached 40 potential investors, 39 said no,” Lau says. “It wasn’t because the idea wasn’t good but because I failed to communicate it.” With practice, his pitch kept improving.

As Wattpad grew, Lau’s job shifted to communications and strategy. Now with a staff of 130 and with 45 million monthly users (even CanLit star Margaret Atwood has published new work on the site), Wattpad has moved toward becoming a global entertainment company, partnering to co-produce original Wattpad stories for movies and TV.

“It’s almost like every year I’m getting a new job, which can be very daunting if you’re not good at self-learning,” Lau says. – MARCIA KAYE



No. 2

Find a business idea you feel passionate about

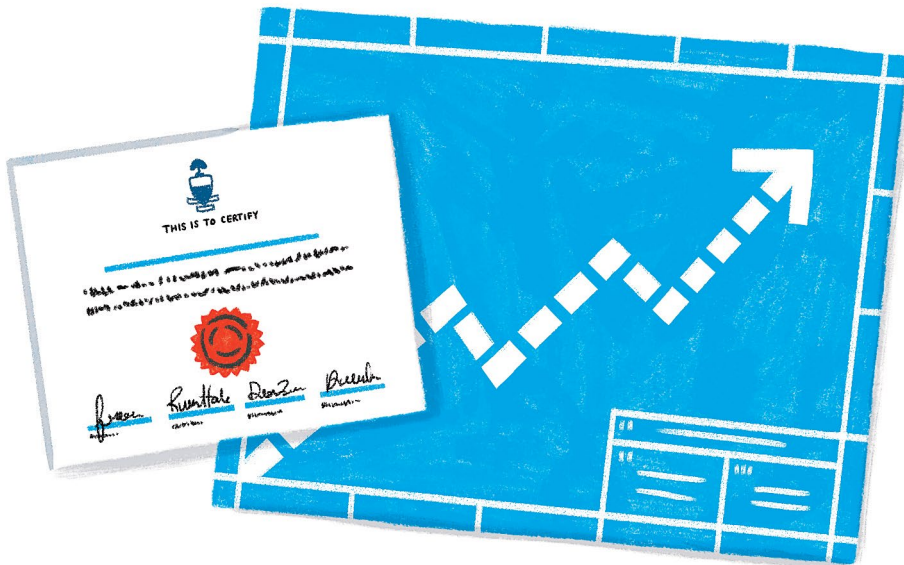
From her unique perspective as a serial entrepreneur and a mentor, Cynthia Goh looks for a certain special enthusiasm as a major predictor of success. “The most important thing is passion. Not for making money, but for the idea.” No matter how awesome your business concept, she says, if you don’t believe in it strongly enough you’ll give up at the first obstacle. “Being an entrepreneur can be a tough road, so you’ve got to be fuelled by passion.”

She cites a recent U of T success story. Adrenalase sells performance clothing that realigns posture, and Goh credits the infectious enthusiasm of founder and president Nouredin Chahrour, a kinesiology grad, for the company’s early achievements. “He is obsessed with muscles and how they function,” Goh says. In 2015, that passion helped persuade four of the five venture capitalists on CBC-TV’s *Dragons’ Den* to offer him deals. – MARCIA KAYE



No. 3

Get an advanced degree, and set audacious goals



Kristjan Sigurdson (MA 2013) is the associate director of the **Creative Destruction Lab** and a PhD candidate at the Rotman School of Management. Launched in 2012, the Creative Destruction Lab's nine-month program pairs startup founders with experienced technology entrepreneurs and investors. The program, based at U of T's Rotman School, is designed for early-stage, science-based technology companies.

Having an advanced degree and setting audacious goals for your startup gives you three important advantages, says Kristjan Sigurdson. First, your deep expertise gives you the credibility to go into a meeting with investors, teach them something about the future of science or technology and convince them that you can meet your goals. "If you do that successfully, they're probably going to want to take another meeting with you."

Second, it enables you to hire others with deep expertise in your field. If you have an MBA but no experience in quantum physics, it's difficult to recruit someone with a PhD in quantum physics, Sigurdson observes. "It's easier to learn how to run a company than it is to become a leading expert in a field."

Third, when your company trajectory invariably changes – because of an obstacle you couldn't anticipate – it's

easier to adapt if you have a deep well of knowledge to draw from and a network of like-minded experts to help you.

Sigurdson offers the example of a founder working with the Creative Destruction Lab whose audacious goal is to build a next-generation quantum computer that uses off-the-shelf components and works at room temperature (most quantum computing research is conducted at low temperatures). The founder has a PhD in quantum information theory and a large network of collaborators in multiple countries. "If he just had an undergraduate degree in physics and a faculty adviser – or an MBA and a business plan – he wouldn't have lasted long in a room with investors," says Sigurdson. "And the audacious goal will help him to attract the top-notch talent he'll need to succeed."

– SCOTT ANDERSON

Daniel Debow is a serial entrepreneur and an adjunct professor of law at U of T. A member of the teams that founded **Workbrain** and **Rypple**, Debow and his partners sold Rypple to Salesforce in 2012, but Debow stayed on for three years to oversee emerging technologies. He is currently building a new startup, **Helpful.com**.



No. 4

Accept that sometimes you'll be unlucky, and move on

"One of the most important lessons I learned," says Daniel Debow, "was from David Ossip (the founder of Workbrain). It was the power of the word 'unlucky.'"

Early in his career, Debow collaborated with Ossip (BA 1988 UTSC) on Workbrain – a workforce-management software system for companies with a large number of hourly staff. After 18 months of development, they'd finally landed British Airways as a customer and Ossip was planning to attend an airline conference in order to pitch new clients. But the day he was scheduled to travel was Sept. 11, 2001. He never got to the conference, and the terrorist attacks sent the aviation industry into a years-long tailspin. No one was buying new systems.

"David just said, 'unlucky,' and we went off and built another plan." The point, Debow says, is that entrepreneurs like Ossip don't dwell on unforeseen disasters; nor do they spend time obsessing over what went wrong. "I learned you have to take the world as it is, not as you wish it to be," reflects Debow. "Stuff happens. You have to respond."

– JOHN LORINC

No. 5



Spend at least one day a week cultivating relationships with investors

Anthony Lacavera (BASc 1997) is the founder and chairman of the **Globalive Group**. He also founded **Wind Mobile**, which was sold in 2015 to Shaw Communications for \$1.6 billion.

“It doesn’t matter how good your technology or your team is,” says Anthony Lacavera, who, in the past 20 years, has founded a dozen startups – mostly in telecommunications and software. “If you have no capital, someone with technology or a team that’s not as good but who *has* capital will beat you 10 times out of 10.”

Lacavera advises entrepreneurs to continually build relationships with investors by talking to their existing ones, asking for referrals to new ones and cold-calling potential ones. He’s done that for years, and that’s why he was able to raise \$700 million to start Wind Mobile in 2008. “Wind succeeded not because I’m a great salesperson or had an unbelievable business. It’s because I was able to raise the capital,” he says. – **MARCIA KAYE**

No. 6



Test out your ideas in the real world. Don’t get caught in analysis paralysis

For entrepreneurs pushing themselves to create a unique product, there’s always a powerful temptation to devote too much time to perfecting a solution, and not enough to getting it out the door. The lesson, according to Toni Allen: “You lose opportunities. You have to get out there and test your ideas.”

Allen’s five-year-old firm, R3VE, provides user experience, service design and business model innovation to large corporate clients, including banks. Early on, Allen recounts, she was developing a product geared at a specific retailer. Allen had identified the right person to pitch and had created a proposal, but waited too long before making her approach, and the ship sailed.

This habit of mind – overplanning –

came from her days working in a large bank, where she’d sought to convince her colleagues that they needed to focus on the way design and technology overlap in the delivery of financial services. In that setting, she recalls, “I didn’t know how to pitch ideas and make a business case.”

Those early instincts about the opportunity for leveraging design thinking and user experience principles in the financial services market proved to be correct and provided the impetus for R3VE. But her insights only became a viable business when she got herself in front of customers: “When you have an idea, you need to try it and test it. Don’t get caught in analysis paralysis.”

– **JOHN LORINC**



Toni Allen (BA 1998 UTM) is the founding partner of **R3VE Business Design Inc.**, which specializes in user experience and business innovation.



Sonya Amin (MSc 1999, MScBMC 2003) is the director, client services, of **AXS Studio**, which she co-founded in 2004 with Eddy Xuan (MScBMC 2003) and Jason Sharpe (MScBMC 2003). With 15 employees at its downtown Toronto office, the company creates visuals for teaching science and life sciences, including illustrations, animations and interactive applications.



No. 7

Choose your business partners carefully and communicate openly and honestly with each other

In hindsight, says Sonya Amin, she was lucky. She and her two business partners share the same goals for AXS Studio and their individual strengths complement each other. But they didn't spend much time planning it that way, she admits. "We went into it as a dream that three classmates shared when they were in school."

What they did have was trust in each other – crucial for a relationship that, like a marriage, will be sorely tested at times, says Amin. "If you don't trust your partner with your life then you shouldn't be getting into business together."

Amin says the ability to speak openly and honestly with each other is paramount – a lesson the AXS Studio founders learned when it became apparent that they were not aligned on how they defined growth for their company. "We had to have a candid conversation, and managed to get to the heart of the matter: AXS's goals needed to be

aligned with our rarely discussed *personal* goals."

This realization prompted the partners to emphasize open and clear communication with their employees as well. "When we hear of anyone talking vaguely, or if we suspect that people might be working at cross-purposes, we stop and look at it more closely," she says. "This has helped in lots of different areas from human resources to day-to-day production."

Amin credits the U of T biomedical communications program with enabling students like her, with an aptitude for both art and science, to make a career out of their dual loves. The program is also very practical, she says, adding that staff recommended clients when she and her co-founders launched AXS Studio. "They're amazingly supportive of their students."

– SCOTT ANDERSON

No. 8



Don't mistake expressions of interest from potential customers as evidence that you've tapped into a viable market

Karl Martin (BASc 2001, MASc 2003, PhD 2011) is the co-founder and chief technology officer for **Nymi**, a tech company that allows users to gain access to their devices by wearing a wristband that detects their unique heart pattern.

Throughout 2015, executives for Nymi, a Toronto firm that's developed a wristband security device, were doing the rounds, talking up their technology to potential customers. At meeting after meeting, recalls Nymi's co-founder Karl Martin, they'd hear the same thing: we love your technology, which allows wearers to log onto a range of computer devices by detecting unique heartbeat patterns, but we need more features and capabilities.

As Martin recounts, he and his team were energized by all that interest, but they had big challenges taking the next step, which was to really figure out how to hone the positioning of their device to fit the needs of specific users. Indeed, says Martin, it was only after Nymi started getting orders from

pharmaceutical manufacturers that he realized what the stumbling block had been. In ordinary office settings, there was no way to compel employees to wear the wristbands. But in the controlled environment of a manufacturing facility, where workers are required to wear sterile and protective gear, that problem evaporated. And so did the sales roadblock.

The lesson, Martin observes, is that many entrepreneurs whose startups are transitioning from research and development to marketing glom onto the slightest spark of interest from potential customers as evidence that the firm is ready to lift off. "Recognize that you usually think you have a product-market fit before you actually do." – **JOHN LORINC**

Kim Shannon (BASc 1980, BCom 1986, MBA 1993) is the founder, president and co-chief investment officer of **Sionna Investment Managers**, which has assets of \$5 billion.



No. 9

Be prepared to act quickly when faced with a big challenge

As Sionna Investment Managers has grown over the past 15 years, says Kim Shannon, so has her need to be adaptable. "You have to keep nimble as issues emerge because you never know what's around the corner." One of the most significant challenges happened when her biggest client – a fund

company representing 90 per cent of her business – asked her to lower her rates for them. "We fired them," Shannon says. A risky move indeed, but she knew that working with a difficult or controlling client didn't fit with her long-term goals for the company.

It was a tense time, but a brief one.

Soon other interested companies began approaching Sionna. "Before, those companies hadn't wanted to be secondary clients," she explains. "But once the big one was gone, we had people coming to us. They actually admired us for what we'd done." Sionna quickly diversified its client base and expanded the business. Ultimately, Shannon mended relations with the big client and she now includes the company's stock in Sionna's portfolios.

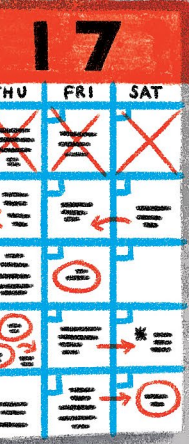
While she was a student at U of T, Shannon served on student council, launched a women's newspaper and started a peer-counselling program. She credits her volunteer activities for building her skills in organization, leadership and collaboration. "If you have volunteer experience, your career progress will be much faster," she says. "Many successful people I see in business were once student leaders."

– **MARCIA KAYE**

Sources: Times Higher Education Top Universities Working with Most Innovative Firms www.timeshighereducation.com/news/top-universities-working-most-innovative-firms, U of T's Innovations and Partnerships Office, U of T Entrepreneurship

Innovation U

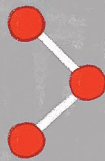
When it comes to innovation and entrepreneurship in Canada, U of T is in a class of its own



In 2016, U of T was the only Canadian institution to break into *Times Higher Education's* first-ever analysis of the top 25 universities working with the world's most innovative companies

Between 2013 and 2015, researchers at U of T and its partner hospitals created an average of one new invention every 21 hours and filed a new patent application about once every three days

About three-quarters of U of T inventions are co-developed by students or post-docs



More than 26,000 people (many of them students) participated in events focused on entrepreneurship in 2015-16



Entrepreneurial hubs across the university's three campuses assist more than 200 student-led startup teams each year



U of T offers 68 courses covering various aspects of entrepreneurship

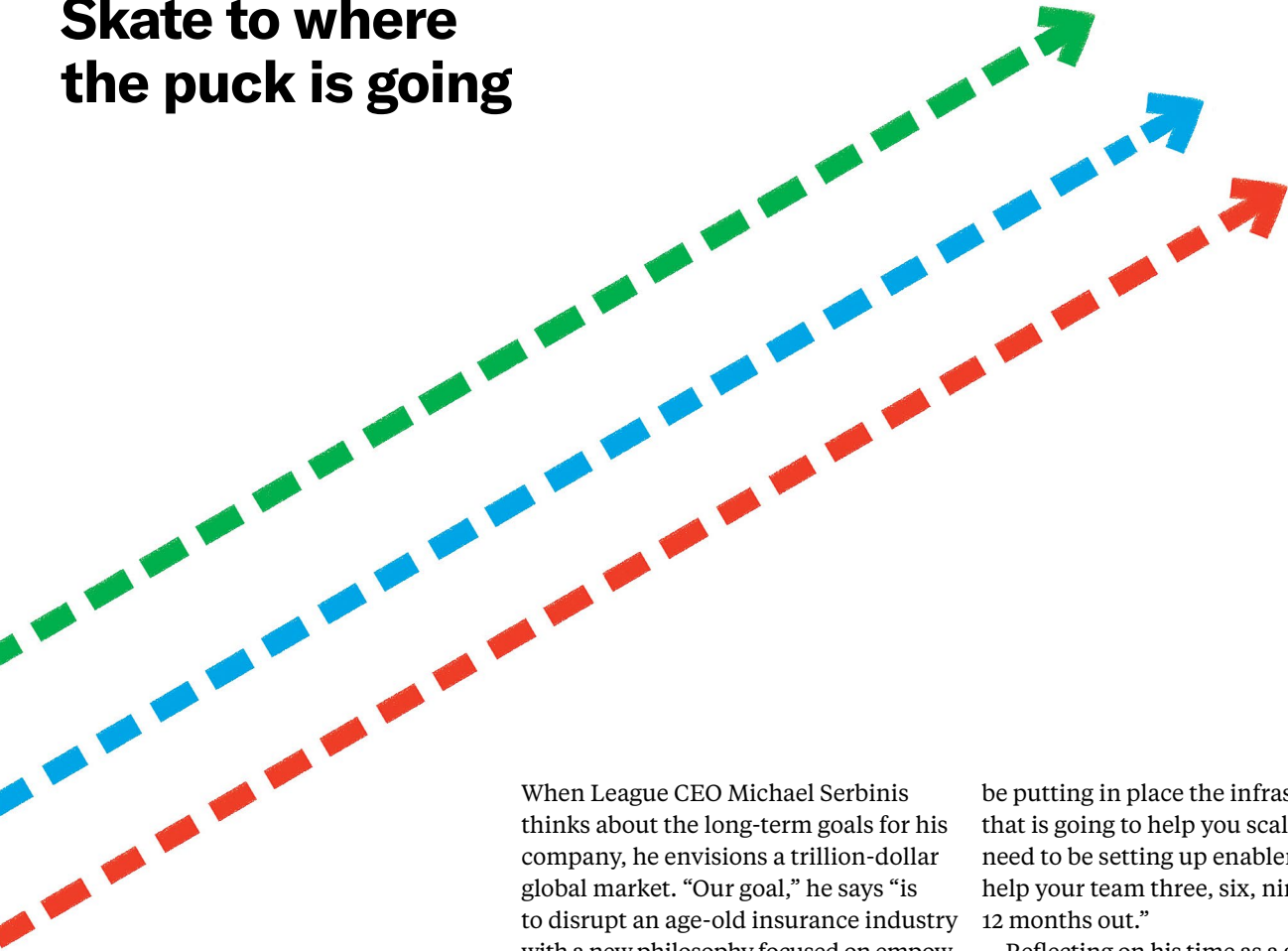
More than 150 research-based startups have launched in the last five years at U of T

In the last 10 years, U of T startups have secured over half-a-billion dollars of investment

Among U of T's better known startups are Nanoleaf, Nymi, Arda Power, BlueRock Therapeutics, Whirlscape, Deep Genomics, Chip Care, Blue J Legal, and Xagenic



Skate to where the puck is going



When League CEO Michael Serbinis thinks about the long-term goals for his company, he envisions a trillion-dollar global market. “Our goal,” he says “is to disrupt an age-old insurance industry with a new philosophy focused on empowering people to be healthy every day.”

As the head of a startup, though, Serbinis needs to balance his long-term ambitions with the smaller challenges he and his team face every day. As with all startups, League staff are building product, hiring and firing staff, landing the next customer, making payroll, meeting investors and more. “It never stops,” says Serbinis, “and it is pretty easy to get caught up in the short term.

“But you have to keep your eye on the prize. I do that by having very clear long-term objectives that I repeat over and over to myself and the team. We regularly review our plans and brainstorm: What’s it going to take to meet our long-term goals? What are the risks and what are the opportunities?”

Serbinis says it’s important to make bets on the future. “As CEO, you cannot be consumed by today. You need to

be putting in place the infrastructure that is going to help you scale. You need to be setting up enablers that will help your team three, six, nine and 12 months out.”

Reflecting on his time as a grad student at U of T, Serbinis says his supervisor was Joseph Paradi, an engineer turned entrepreneur who built Dataline, one of the first digital stock-quote platforms in Canada. “He was my mentor at a time when I had no money and I didn’t know what being an entrepreneur meant or how to lead or manage teams,” says Serbinis. “He inspired me and we still keep in touch to this day.” – **STAFF**

Michael Serbinis (MAsc 2001) is the founder and CEO of **League**, a digital health insurance platform. Previously, he co-founded **Kobo**, the e-reader service.



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in more ways than one.”

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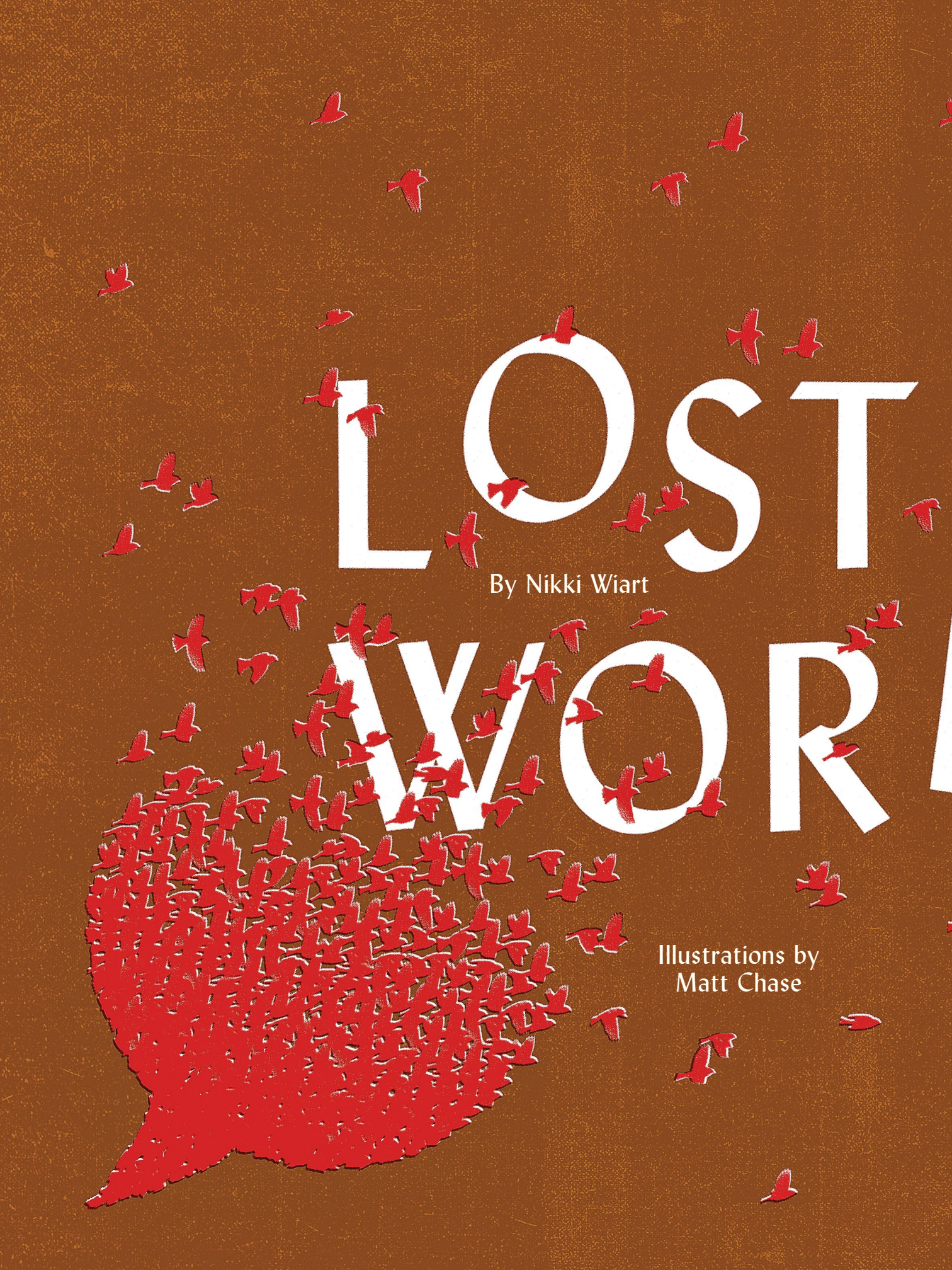
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LOST

By Nikki Wiart

WOR

Illustrations by
Matt Chase

Dozens of Indigenous languages in Canada are in danger of disappearing. What will it take to save them?

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“VRRRRRRRRRRRRRIIIIIIIIBBBBBB.” Jennifer Sylvester’s hands grip an imaginary steering wheel; her foot presses hard against an invisible gas pedal. The 40-year-old student and mother is sitting on a colourful, padded chair in the common area of the University of Toronto’s Centre for Indigenous Studies, located at 563 Spadina (or *ishpadinaa*, the Anishinaabemowin, or Ojibwe, word for high hill). She’s surrounded by about a dozen other people. It smells of sage, and of winter.

Sylvester is about to get up and walk away from her make-believe car, when someone in the circle shouts: “*Maaciipiso!*” – Anishinaabemowin for leaving a vehicle. The group is playing a game called *Baapaase*, or wood-pecker. It’s a marriage of Jenga and charades: blocks with Anishinaabemowin words and phrases written on them are stacked one on top of the other. Participants tap, tap, tap the blocks out of the stack, and then perform whatever action is on that block. Sylvester had an easy one – there’s also *aagonigebagizo* (skinny-dip) and *boogidigwaami* (fart in one’s sleep).

Baapaase was invented by Jenny Blackbird – co-ordinator of Ciimaan/Kahuwe’yá/Qajaq (CKQ), the Indigenous language hub within the Centre for Indigenous Studies. In this role, Blackbird, who is part Nehiyaw (Plains Cree) and part Finnish, organizes events such as the Indigenous Language Games that Sylvester took part in, and offers support and resources to students in the Indigenous Studies program. She also co-hosts “Indigenous Waves,” a weekly show on campus radio station CIUT that features music, storytelling and interviews.

Earlier that day, I had sat with Blackbird at her desk, where she used Scrabble tiles to spell the word “tansi,” which means “hello” in Plains Cree. Blackbird believes deeply in taking language instruction outside of the classroom. Besides introducing her students to word games such as *Baapaase* and sCREEble – the Indigenous-language version of Scrabble – Blackbird organizes events such as Cree Language Bingo and brings in elders to instruct traditional crafts such as beading. Indigenous languages are animated

and action-oriented, so “trying to play sCREEble is more fun than writing stuff down or just reading a book,” says Blackbird.

The CKQ activities that Blackbird organizes belong to a range of programming offered through U of T’s Centre for Indigenous Studies that provides students with formal and informal instruction in Anishinaabemowin and Kanien’kéha (Mohawk), which are both spoken in Ontario, and Inuktitut, one of the main Inuit languages in Canada. The centre, founded in 1994 under another name, has focused on language courses from the start, says interim director Keren Rice, because of its central role in understanding Indigenous cultures. “There is so much knowledge to gain from language,” she says. “You get a deeper understanding of a culture, helping you to see the world through different eyes.”



According to a 2010 UNESCO report, about half of the world’s more than 6,000 languages are at risk of disappearing over the next century. Eighty-seven of these are Indigenous languages in Canada, including the South Slavey language – considered “definitely endangered” with roughly 900 speakers spread across 13 communities – and the “critically endangered” Munsee language, with fewer than 10 speakers on a single reserve in Ontario. Another source, the National Geographic Society’s Enduring Voices Project, gives many of these languages a low likelihood of surviving into the next century. The project found that, in 2011, just 15 per cent of Indigenous people in Canada reported speaking an Indigenous language as their mother tongue, down from 87 per cent a half-century earlier.

The disappearance of these languages, and these language speakers, won’t directly affect most of the world’s people – two-thirds of whom speak just 12 languages as their native tongue. But a language that goes extinct sends a bleak message, both in the erasing of cultural identity and the silencing of a world view that can never be recovered. This loss also has very real, and potentially dire, ramifications for the Indigenous communities where these languages are spoken. A 2007 study by researchers at the universities of Oxford, British Columbia and Victoria that looked at 150 Indigenous

communities in B.C. found that areas where at least half of the people had a conversational knowledge of their Indigenous language, youth suicide rates were very low – and in some cases zero. In communities where fewer than half of the members had this

The Anishinaabemowin, or Ojibwe, language commonly uses three sets of double vowels: *aa*, *ii* and *oo*. They correspond in English to the sound of the “a” in “father,” the “ee” in “seen,” and the “oo” in “boot.” Nasal vowels are created by adding “nh” after the vowel, as in *banajaanh*, which means “nestling.” There is no equivalent sound in English.

knowledge, youth suicide rates were, on average, six times higher. (Overall, the suicide rate among First Nations youth in Canada is five to seven times higher than that of non-Indigenous youth. For Inuit youth, the figure is 11 times higher.)

Canada’s Truth and Reconciliation Commission, which released its final report in June 2015, was created to acknowledge government-sponsored abuse at residential schools, and to offer recommendations for reparations. Included in these calls to action were the protection and strengthening of Indigenous languages. This makes eminent sense to the linguists and Indigenous-language speakers at U of T, who see language revitalization and the broader goal of reconciliation as closely linked: a language can’t be revitalized until past trauma has been reconciled, and past trauma can’t be reconciled until a language is revitalized. It’s a chicken-or-egg debate that makes the whole process more complicated than simply having good teachers and students with a willingness to learn. “It’s challenging to admit as an Indigenous person that you don’t know your language,” says Ryan DeCaire, a Mohawk professor at U of T. He says many Indigenous people feel a sense of loss when they do not speak or understand their language. It is something that “we feel we should already know, and not knowing it perpetuates feelings of shame, anger and frustration.”

DeCaire, 29, began working at U of T in 2016, and teaches a course in Kanien’kéha and in language revitalization. In his early 20s, DeCaire enrolled in Onkwawenna Kentyohkwa, a two-year immersion program in Kanien’kéha at the Six Nations Grand River Territory. Prior to that, DeCaire knew only the flash-card version of his language: hello, goodbye, numbers and basic phrases. Today, he’s one of fewer than 10 people in his community of Wáhta Kanien’kehá:ka Territory – north of Toronto, in the Muskoka area – who is fluent; the others are all over the age of 70. “Learning the language has been a critical piece to understanding my own identity of being Kanien’kehá:ka,” he says. “It’s played an essential role in my own mental health and spiritual well-being.”

Now that DeCaire is able to speak the language himself (for which he credits the “giants” in Mohawk communities who have been working to keep the language from “going to sleep”), he admits he feels an acute degree of responsibility to pass on what he knows. “On paper, I work for the University of Toronto,” says DeCaire. “But in my heart, I work for our languages – and for our people.”

In 2011, only 545 people in Canada reported speaking Kanien’kéha as their mother tongue – UNESCO rates it as “definitely endangered.” DeCaire is deeply aware of the challenges to expanding this number, noting that people lose their facility with a language if they can’t practise it. He’s tried to organize his own life, he says, so he can continue speaking the language regularly. Few jobs exist for Kanien’kéha speakers (though he was fortunate to find one). At the moment, DeCaire doesn’t have children, but he knows that, if and when he does, he will raise them with Kanien’kéha as their first language.

In Kanien'kéha, the Mohawk language, complex verbs can be formed to express an idea that in English would require an entire sentence. The Mohawk word *Wa'khenstaienthokwenni:rene*, for example, means "I was on my way to harvest corn for her."

His partner will also need to speak Kanien'kéha. The stakes, he feels, are high. "We can lose the language in one generation – a language that has developed over hundreds of years, thousands of years,"

he says. "It's our connection to the past, our ancestors. It gives us a sense of social cohesion, and it connects us to our land."

DeCaire, who taught at an adult immersion program in Kahnawake, near Montreal, prior to coming to U of T, brings that same style of teaching to his university classes. He speaks almost exclusively in Kanien'kéha to his students, and focuses less on memorization and repeat-after-me-phrases, and more on understanding the basic patterns and rules of a language in which words are made up of many

different parts. The word for university, for example, is *Tsi Ionterihwaienstahkhwa'kó:wa* (dzee yoon-day-re-wa-yun-stah-kwa'-go-wa), which translates literally into "the great place of study." In Indigenous languages such as Kanien'kéha, Anishinaabemowin and Inuktitut, the primary component of the sentence is the verb, not the noun, as it is in English and French. "We describe a lot of the world around us in terms of what it does," DeCaire says. So a chair is not just a chair, it is the thing that holds up your bottom.

U of T professor Keren Rice encountered a similar shift in thinking while studying the language of Dene communities in the Northwest Territories. She would be knitting a scarf, and someone would ask her why she was "wasting her yarn." Or they would ask her to "spill them some water," instead of pour it. She had to wrap her head around the new and neutral meanings of those words, and ignore the negative English connotations associated with them.

Rice, who holds a PhD in linguistics, has been studying the Dene since her years as a graduate student at U of T in the

Indigenous Words Every Student Should Know

- A** Anishinaabemowin
- K** Kanien'kéha (Mohawk)
- I** Inuktitut

University of Toronto
 Toronto: Tkaronto
Where there are trees in water **K**
Tsi Ionterihwaienstahkhwa'kó:wa
The great place of study **K**

Studying
 Naah towewin **A**
 Satéweienst **K**
 Ilinniaq **I**

Coffee
 Pahkaanaapoo **A**
 Ohso'kwákeri **K**
 Kaffi **I**

Cellphone
 Kiimooci maacii kitowin *Secret/concealed phone* **A**
 Ieiéhas teiehtharáhkhwa' *What you take with you and use to speak with* **K**
 Uqaalautiralaag *Cellphone* **I**

Computer
 Wiintipikaan *Artificial brain* **A**
 Waterihwateweién:tons
It stores information **K**
 Qaritaujaq *Thing with a brain* **I**

Professor/Teacher
 Okihkinoohamaakew **A**
 Iakorihonnién:ni **K**
 Ilisaiji **I**



The Kanien'kéha alphabet contains 12 letters, and symbols to indicate pronunciation. A colon marks a long vowel. A descending accent (à) indicates a stressed vowel with a falling tone, while a rising accent (á) indicates a stressed vowel with a high tone. An apostrophe marks a glottal stop, which is the audible release that occurs after the vocal cords are closed (as between the "uh" and "oh" in the English "uh-oh").

to this work – creating dictionaries and teaching guides, developing writing systems, and studying the role of storytelling in preserving language and culture. Rice says language courses offered at a university shouldn't be taught in an "English-translated" way. "So it's not English with words in Mohawk, or English with words in Anishinaabemowin, but the language as it is," she says – and that includes not only the grammatical intricacies and structural differences in the way we speak, but the way of thinking.

Rice was a member of the steering committee that produced U of T's Truth and Reconciliation report, released in January. The report contains three calls to action involving Indigenous languages, including naming spaces on U of T's campuses using Indigenous languages. Rice says that much like making a statement of land acknowledgement (Toronto sits on Anishinaabe territory) or replacing "thank you" with "miigwetch," giving university spaces an Indigenous name could help familiarize many people with the language. "There's English all over the place," Rice says. "So it's just part of your environment. But Indigenous knowledge is not present in any kind of sense that people can see it. [By] naming things, people can start using those words."

1970s. This was before language endangerment and the need for revitalization were even on Canada's radar – though the importance of language was already being discussed in many Indigenous political organizations. While she's not Indigenous herself, Rice has dedicated her life

In the months and years to come, student Jennifer Sylvester hopes to see "more emphasis on the importance of reclaiming Indigenous knowledge, because a lot of our Indigenous knowledge is entrenched in language, and we need to ensure that this is protected and preserved." Sylvester, who's Anishinaabe, with family from Chimnissing, or Christian Island, in Georgian Bay, already speaks a bit of Anishinaabemowin, and is now learning Kanien'kéha in DeCaire's class. "There is a spiritual connection when learning any Indigenous language," she says, "but learning Anishinaabemowin connects me to my family and my ancestors." On top of raising an 11-year-old son, Sylvester is president of the Indigenous Studies Students' Union, is in the final semester of her Indigenous Studies degree and has applied to law school for the fall. She hopes to be part of the federal government's reconciliation process, as an adviser or advocate with respect to Indigenous languages.

Despite growing up in Toronto, Sylvester has retained the traditional knowledge passed down to her by her parents and her relatives still living on Chimnissing – something she hopes she can share upon entering, and eventually graduating from, law school. Her spirit name is *Mandaagtaagozid Bneshiinh Kwe*, or Beautiful Sounding Bird Woman, and it suits her. She's quick to laugh – a contagious, song-like laugh – but that's not, she's decided, the reason for her given name. "It hit me within the last year," she says. "I always thought it was because I was a singer. But it's because I'm going to use my voice to fight for Indigenous rights, I'm going to fight for revitalization, I'm going to fight for reclamation."

Nikki Wiart is a freelance writer and a farmer, with Métis roots tracing back to the Batoche settlement in Saskatchewan. She has written for *The Walrus*, *Maisonneuve* and *Maclean's*.

How to Type in Inuktitut

A U of T PhD student is making fonts and keyboard layouts for Indigenous languages available for free



If you've ever seen someone tweet in symbols and letters you can't find on a standard keyboard, it's likely thanks to Chris Harvey, a PhD candidate in linguistics at the University of Toronto and self-proclaimed "language geek." Harvey has spent the last 15 years offering free fonts and keyboard layouts for the alphabetic and syllabic characters used in Indigenous writing through his website, languagegeek.com. This makes it possible for Indigenous language speakers to write emails and build websites in their own language.

"Deep down, it's a human rights issue," Harvey says. "Why is it I can buy my computer and have it type English and French and Russian and Chinese, but if I want it to type Inuktitut, I have to pay \$40,000 for it? And that's how much companies were charging then for language support I could do in five minutes." Harvey has since built downloadable fonts and keyboard layouts for dozens of Indigenous languages from all over North America.

Harvey, whose resumé includes working for the Indigenous Language Institute in New Mexico,

is writing his dissertation on efforts to bring back from dormancy the Mahican language – an Algonquian family language that hasn't been spoken since the 1930s. Because there are no recordings of the language, Harvey has been reverse-engineering documentation from German missionaries and linguistic transcriptions.

Harvey took a Cree immersion class in 1995 (which led to his Language Geek project), and later learned Welsh, also a vulnerable language, in an immersion program in Wales. He sees a connection – a kind of shared history – between his own Celtic roots and those of Canada's Indigenous peoples. "The kind of institutionalized abuse that happened in North America was first attempted in Celtic regions of Europe," Harvey says. "A lot of the residential school practices were invented in places like Ireland and Wales." – NIKKI WIART

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Hosted by the University of Toronto Alumni Association (UTAA)

alumni.utoronto.ca/utaa



KEYNOTE SPEAKER:

BRIAN STEWART

Distinguished Senior
Fellow, Munk School of
Global Affairs

- One of Canada's most prominent journalists, providing Canadians with a window on the world for more than three decades through reports for CBC's *The National* and his show, *CBC News: Our World*.
- The first North American broadcast reporter to focus the world's attention on the Ethiopian famine of 1984. In the Gulf War of 1991, Stewart was the first Canadian reporter to gain access into Kuwait City during its liberation.
- Has interviewed many world leaders, including Margaret Thatcher, Henry Kissinger and Nelson Mandela.
- A recipient of the Queen's Silver Jubilee Medal and the Order of Ontario. A Gemini Award winner for Canada's Best Overall Broadcast Journalist.

Now retired from daily reporting, Stewart remains one of Canada's most respected journalists. He continues to write frequently for cbcnews.ca on international affairs and contributes to CBC special reports.

ALUMNI CELEBRATION

11:00 a.m.–12:30 p.m.
Convocation Hall, 31 King's College Circle

Featuring:

- Presentation of the Carl Mitchell Award for Community Engagement
- Keynote address by Brian Stewart
- UTAA AGM (brief business meeting), which will include a vote to ratify amendments of the UTAA By-Law No. 2008-1 being made in anticipation of the new Ontario Not-for-Profit Corporations Act requirements. Details can be found at alumni.utoronto.ca/utaa

ALUMNI BBQ

Immediately following the Alumni Celebration
12:30 p.m.–2:30 p.m. on the front campus

Registration is required for both events.
Get more details and RSVP at:

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Stress-Free Degrees

Here's a sample of our fascinating lecture line-up.
Check the website for a full listing and details.

THURSDAY, JUNE 1

6:15 p.m.

- Great Museums of Lake Erie
— Mary Redekop
- The Role of Self-Knowledge in Well-Being — Erika Carlson

FRIDAY, JUNE 2

12:00 p.m.

- When Memory Fails: Toward Better Treatments for Alzheimer's Disease
— Graham Collingridge
- Lee Strasberg, Marlon Brando & the Sound of Authenticity
— Jacob Gallagher-Ross
- Carbohydrates: Not just Empty Calories
— Mark Taylor

3:15 p.m.

- Canada's Odyssey: A Country Based on Incomplete Conquests — Peter Russell
- An Antidote to Anti-Vaccinism
— Natasha Sarah Crowcroft
- Had your Sleep Check-up? Feel Better, Think Clearly & Live Longer
— Colin Shapiro



FRIDAY, JUNE 2

6:15 p.m.

- Work & the Quest for Meaning
— Scott Schieman
- Fatal Attraction: The Lure of Literary Villains — J. Barbara Rose

SATURDAY, JUNE 3

9:45 a.m.

- Exercise Programs for the "Un-fit"
— Darlene Reid
- Making Sense of Mixed Health Messages in the Media
— Laura Rosella
- Colonialism & Canadian Confederation — Brian Gettler



2:30 p.m.

- Everyone Screws up Sometimes: Scientific Uncertainty in a Post-Truth World — David Bailey
- *Engineering Today*
Our New Building & the Future of Engineering Education — Ron Venter;
Engineering Skeletal Muscle in a Dish — Penny Gilbert; Too Hot, Too Cold or Just Right: Thermal Comfort in High-Rises — Marianne Touchie

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Stress-Free Degrees

Continued

SATURDAY, JUNE 3

2:30 p.m.

- Sexuality & Sport: The Impact of Normativity for Athletes — Caroline Fusco
- The World is Charged with Faith & Beauty: Three Writers, Three Visions — Randy Boyagoda

3:45 p.m.

- Clarity about Mindfulness & How it Probably Works — John Vervaeke
- Discovering Ghostly Galaxies — Roberto Abraham
- The Curious World of Probabilities (For Young Alumni) — Jeffery S. Rosenthal

Please note that the lecture schedule is subject to change and additions. Visit springreunion.utoronto.ca for up-to-date information.

Flagship Events

WEDNESDAY, MAY 31

SHAKER for Young Alumni
Canada's Wonderland
1 Canada's Wonderland Drive

THURSDAY, JUNE 1

LGBTQ Spring Soirée
Storys Building
11 Duncan Street

FRIDAY, JUNE 2

- Chancellor's Circle Medal Ceremonies for 55th to 80th Anniversaries
- 50th Anniversary Ceremony

SATURDAY, JUNE 3

- Campus Bus Tours
- Kids' Passport to U of T — a family event

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SATURDAY, JUNE 3

11 a.m.–12:30 p.m.

U of T Alumni Celebration
Convocation Hall
31 King's College Circle

Featuring:

- Presentation of the Carl Mitchell Award for Community Engagement
- Keynote address by Brian Stewart
- UTAA AGM (brief business meeting)
See ad on page 43.

12:30–2:30 p.m.

Alumni BBQ
Tent, Front Campus

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Ursula Franklin,
at U of T, circa 1980

By Stacey Gibson

WARRIOR FOR PEACE

U of T physicist Ursula Franklin staunchly opposed weapons of mass destruction. As Cold War tensions rise, her work remains as relevant as ever

BERLIN IN THE 1920S was the vibrant cultural hub of Germany. Although the city was wounded, both financially and emotionally, by the First World War, it possessed a fervent intellectualism. Post-expressionism and Bauhaus architecture were taking hold, and science was pre-eminent – Einstein, working in Berlin, had won the 1921 Nobel Prize for physics.

It was here that the late Ursula Franklin – physicist, public intellectual, pacifist – had spent her childhood. Born in Munich in 1921, she was the only child of Albrecht Martius, an archeologist, and Ilse, an art historian. “My parents were intellectuals in the real sense of the word,” she said to CBC Radio in 1986. “Their joy came not from possessions and status, but from the life of intellect and theatre and books and talking.” Monthly trips to the Berlin Philharmonic (they went to the more affordable dress rehearsals) ignited in her a lifelong passion for classical music. Beethoven’s works, under

renowned conductor Wilhelm Furtwängler, were some of her favourites. One of her parents’ closest friends, physicist Hans Kuppenheim, fostered her love of science and interest in math more than anyone else. “I was interested in knowledge. I was always fascinated by how things worked. I think I must have said more ‘whys’ in my childhood than probably many kids, but I got answers,” said Franklin of her parents’ attentiveness. “And out of that I had this great pleasure of putting things together, which has never really left me.”

If her parents fostered her intellectual curiosity, tragedy shaped her course. Franklin’s mother was born Jewish (although she had switched to Lutheran early in life) – which meant the entire family would be targeted by the Nazis during the Second World War. Franklin was brought up in her father’s faith, Protestantism. The Nazi Party’s rise to power in the early 1930s cast a nefarious shadow over the Franklins’

**FRANKLIN WAS REMOVED FROM
THE UNIVERSITY OF BERLIN WHERE SHE HAD
BEEN STUDYING CHEMISTRY AND PHYSICS,
AND THRUST INTO A FORCED LABOUR CAMP.
SHE AND HER PARENTS WOULD REMAIN IN
SEPARATE CAMPS FOR THE LAST YEAR
AND A HALF OF THE WAR. OF THE TRAUMA,
FRANKLIN SPOKE ONLY FIVE WORDS:
“WE SURVIVED IT. BUT JUST”**

home. “It put the household more or less permanently into darkness. My father, coming from a very old and very distinguished German family found it very difficult at first to think of immigration. The evilness of it was very clear to my mother very early, but my father so late that in fact it was impossible, either for them or for me, to leave Germany in spite of frantic attempts.”

Indeed, she had been offered a scholarship to attend university in Britain, but the British visa was contingent on the applicant being 18 years old. Franklin turned 18 on Sept. 16, 1939. Germany invaded Poland on Sept. 1. “It was just three weeks too late,” she said, speaking emphatically, to CBC Radio. “So we all got stuck during the war in Berlin in various camps.” She was removed from the University of Berlin where she had been studying chemistry and physics in 1943, and thrust into a forced labour camp. She and her parents would remain in separate camps for the last year and a half of the war.

Of the trauma, Franklin spoke only five words: “We survived it. But just.”

FOLLOWING ARMISTICE, Franklin finished her undergraduate studies, then earned a PhD in experimental physics in 1948 from the Technical University of Berlin. At first, she was eager to stay in Germany, thinking it her obligation. But it slowly dawned on her that there would not be the drastic post-war changes to Germany – educational or otherwise – that she had hoped. She was ready to emigrate. She accepted a Lady Davis Fellowship for post-doctoral work at the University of Toronto in 1949.

Ursula Martius entered into Canada on Feb. 6, 1949, via Montreal-Dorval International Airport. Maybe the only thing the customs officers saw was a slip of a girl – at a time when slips of girls were offhandedly dismissed. But this 27-year-old – ennobled and burdened by her past, intellectually incisive, deeply bold – would confront heads of government

over nuclear testing. She would pioneer a new field of scientific thought in engineering. She would take on university presidents over pay. She would mentor young women in the field of science and teach them not to be afraid to shake things up, to say no to men and authority and structures that they didn’t like. She would teach them to reshape the world so it suited them; not to reshape themselves to suit the world. She did not, would not know how to, back down from injustice.

Settling into a little place on 86 Madison Ave., Franklin delved into two years of post-doctoral work in physics and metallurgy, earning \$125 a month. After working as a research scientist at the Ontario Research Foundation, she returned to U of T in 1967: she was appointed the university’s first female professor of metallurgy and materials science, and the second female professor in the Faculty of Applied Science and Engineering. Through her quiet, patient work, Franklin pioneered the field of archeometry – applying modern materials-science techniques to the study of archeological materials. By examining objects – early metals of China, coppers from the High Arctic, Near Eastern ceramics – through these modern-day methods, she could date them. From there, she could figure out what techniques people used to make the items, how they handled them, and the social and technological conditions surrounding them.

While the work might sound niche, it was far from it. Franklin’s interest in the social effects of technology bloomed from her studies, and she soon began teaching at U of T’s Institute for the History and Philosophy of Science and Technology. In her prescient 1989 book *The Real World of Technology* – based on her CBC Massey Lecture – she explored the increasingly entwined relationship between tech and modern-day culture. Comparing technology to the house we live in, she wrote: “More and more of human life takes place within its walls, so that today there is hardly any human

activity that does not occur within this house.” Technology, she wrote, gives rise to the way we organize and to *mindset* – from the hotel key card (which transfers power to the owner, allowing him or her to monitor when a guest comes and goes); to, say, a computerized checklist in health care (supplanting a more nurturing, holistic model in favour of an authoritarian one); to the arms-production system – which makes the mechanics of war a constant, chronic hum in modern-day life.

IN HER FIRST FEW YEARS IN CANADA, Ursula Martius’s personal life flourished along with her career. In 1950, a young engineer named Fred Franklin arrived in Toronto from Vancouver to work on the Avro Arrow. He was also a cellist, and Ursula met him one night when he was playing music with her friends. (Franklin, too, had been born in Germany to a mother who was Jewish, but was studying engineering in Britain by the time war broke out.) Their courtship was simple, and included walks and picnic dinners that Ursula had packed. They bonded over music and, indeed, it would remain a passion for both: into old age, they would listen to their beloved baroque. The couple married in May 1952. Their son, Martin, was born in 1955, and daughter Monica followed in 1958. The hyperactivity and happiness of the early years can be seen in her datebooks from that period: In one – among notations about labwork, meetings, deadlines – is a picture, drawn in crayon by Martin: planes overhead, mommy, daddy and son carrying luggage, smiling. Signalling a busy life, yes, but a happy one.

Franklin, however, was negotiating this terrain of motherhood and career in a silo. Socially, she was undoubtedly a dartboard for all sorts of judgments. Practically, she was without the structural framework of maternity leave and daycare. During her first pregnancy, while at the Ontario Research Foundation, she made it known that she wanted to keep working after the birth of her child. The men in charge were flummoxed. They struck a committee. They hemmed and hawed, but came to no conclusion. So Franklin decided. She skipped her summer holidays while pregnant so that she could have three weeks off with Martin after his birth. She devised a plan where she split her week between the lab and working at home. Her mother looked after Martin. (Franklin had managed to get her parents out of Germany and to her in Toronto.) She repeated a similar pattern with Monica. “The unpreparedness, administratively and legally, to recognize that women, when you employ them, have needs, and require an administrative framework that takes that into account was totally absent,” she told *The Atlantic* in 2014. “So that the task, then, for women like myself who were feminists, was to know that you had to have laws that gave maternity leave; you had to have provisions for flexible work; and the struggle from there on was not for *us*, but was a struggle for all women to have decent working conditions and safe wages. And that’s how it starts.”

SHORTLY AFTER MARRIAGE, Fred and Ursula – who were already pacifists committed to social justice – joined the Quakers. The religious group served as a North Star, guiding them in their principles of pacifism. The Quakers believed the entire war paradigm needed to be dismantled and replaced with a compassionate model. They refused military service, and advocated for disarmament. Franklin, too, wholly rejected war and weaponry. “One of the reasons why [Quakers] have been active in the public domain was not only that they refused to accept war and violence and having to kill or being killed – but felt that no human being should be in a position where they are faced with the command to kill, to do violence,” said Franklin in a CBC Radio interview in the 1980s.

Franklin would spend a lifetime using her science, and her voice, to work toward peace, unequivocally refusing to do research that could benefit militaristic initiatives. Her most influential work was with the “Baby Tooth Survey.” She, in concert with the peace group Voice of Women, collected baby teeth from children across Canada in order to assess the teeth for levels of strontium-90 – a radioactive isotope that increases the risk of cancer and is present in the fallout from nuclear weapons testing. (She gathered her own children’s teeth, too: “I recall being rather upset when the tooth fairy forgot to leave the money under my pillow in exchange for my tooth in her haste!” says daughter Monica.) Franklin presented a scientific brief on fallout to the Canadian government in 1969, outlining the potential health hazards and the measures needed to reduce radioactive contamination in food and the environment. Her work was crucial in the U.S. government’s discussions about, and the eventual cessation of, atmospheric weapons testing under John F. Kennedy. Eventually, the international Limited Nuclear Test Ban Treaty – signed by about 135 countries – prohibited weapons testing on land and in the atmosphere.

Other work Franklin did with Voice of Women included confronting the Canadian government about its role in the research and testing of warfare chemicals – including speaking out against the test station in Suffield, Alberta, which used a large tract of land for testing poisonous agents. She spoke to the Senate about halting this chemical research, and channelling the money toward research into the environment and preventive medicine. She was vocal about Canadian disarmament and withdrawal from NATO. In the ’80s, she participated in an unsuccessful legal battle to allow citizens to redirect part of their income taxes from military uses to peaceful purposes. She let no one – *no one* – off the hook. When Prime Minister Pierre Trudeau passed the War Measures Act during the October Crisis in 1970, she sent him a telegram: “Your unwarranted overreaction destroys the credibility of democratic government. Resign, if you can’t cope with using existing laws.” In 2002, Franklin received the Pearson Peace Medal, awarded by the United Nations Association of Canada.

**“MANY THINGS I DO ARE
MOTIVATED BY THE DEEP WISH
THAT MY CHILDREN SHOULD
NEVER EXPERIENCE MANY
OF THE THINGS THAT I HAVE
EXPERIENCED IN MY LIFE”**

Franklin’s fair and just methods did not stop the RCMP from covertly tracking her movements for 35 years. Almost 600 pages of documents exist – from the years 1949 to 1984 – in police files. A spy in her Voice of Women organization reported to the RCMP on her conversations with fellow members. Another spy snitched on her desire to help young people in Vietnam.

The RCMP could have saved themselves the work. Never did they find any subterfuge. The only deception lay in the Mounties’ tactics. In a letter from 1977, she wrote to a physics colleague, more generally, about the RCMP’s illicit means of supplying information to the prime minister: “In politics the means are the end: Justice cannot be promoted by unjust tactics, democracy is not preserved by authoritarian acts. But there is only a limited timespan within which a society can retract unacceptable means; they quickly become self-perpetuating and assume a dynamic of their own.”

BY THE 1980S, Franklin’s position at the university had reached the upper stratosphere. In 1984, she became the first female at U of T to earn the title of University Professor – an exclusive designation extended to only two per cent of tenured faculty. (Astronomer Helen Sawyer Hogg – another U of T trailblazer – wrote to her: “What I really wish to say is Hurrah! Hurrah! Hurrah! I am so very happy that your excellence has made a breakthrough like this.”) She became the director of Museum Studies in 1987. And Franklin continued to mentor female students – on both academic and professional matters, year after year, to make the path a little smoother for the women who came after her.

After retiring from U of T in 1989, Franklin stayed on campus as a Massey College senior fellow and mentored on a whole different scale when she helped design the curriculum for the Ursula Franklin Academy – a public high school in Toronto built on her ideas of social justice and the thoughtful use of technology. The *Ursula Franklin Reader: Pacifism as a Map* – a collection of her works on peace, citizen activism, feminism and environmentalism and more – was published in 2006. And it was not only younger women that Franklin

looked out for. In 2001, at the age of 79, she and three other U of T female pensioners launched an action against U of T on behalf of retired women faculty and staff members who had been paid less than their male counterparts. They wanted these women’s pensions increased – to match what they should have received, had they been given equal pay for equal work. (The university had a salary review and settlement process in 1989; these women had retired before it was undertaken.) A picture of her in the *Toronto Star* during this challenge in 2001, in the forefront of a group of the women, shows her steely-eyed and determined. The university settled with Franklin and the others, and increased the pensions of about 60 women. “The settlement is welcome,” said the victorious Franklin. “It also ensures that the retired women will immediately benefit, which is especially important as many of them are in their 80s and 90s.”

URSULA FRANKLIN DIED LAST YEAR at the age of 94. Her husband, Fred, died eight weeks later. A series of letters, written in the late ’60s and early ’70s, to a friend, reveal particulars about Franklin’s home life – as well as the universal story of being a parent, being an adult daughter, being immersed in career and being spread very thin – the season of mid-life captured in handwriting. Franklin laments the day her daughter – such a source of joy and friendship to her – will “leave the family circle.” She is concerned about her son’s adolescent ways, his testing of boundaries. She writes of her father, feeling unneeded after her mother’s death. But one letter, earlier in her life, speaks particularly loudly when it comes to the motivation of Franklin. In June 1963, to another friend, she states: “You will surely understand that it is not an empty phrase when I say that many things I do are motivated by the deep wish that my children should never experience many of the things that I have experienced in my life.”

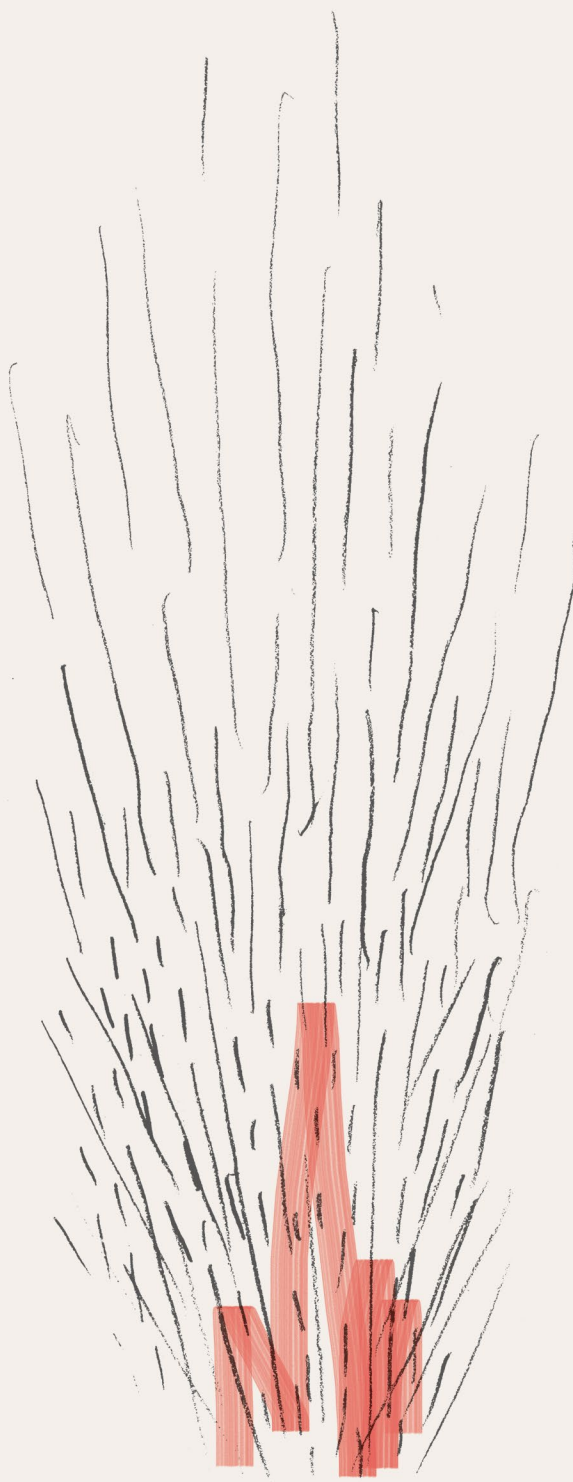
She spoke to CBC Radio about the moral obligations she felt in her life after the Holocaust. She said: “I don’t buy the thought that it could never happen anywhere else, that the constellation of fear, the preceding recession, fascism as a quick, easy solution, and many factors coming together creates a situation in which people find themselves enslaved. [It’s] not drastically, suddenly, that the conqueror moves in, but slowly, day by day, one little step at a time, and that’s perfectly possible in very many other situations. But what it takes to prevent it is witness, and what I feel as one of the survivors of this is the everlasting obligation to not let things slide.

“I felt that very much when, at the end of the war, so many totally innocent had died and where there was no merit, rhyme or reason in having survived except with the burden of responsibility of saying: Whatever one can do to prevent injustice, *one has to do.*”

Stacey Gibson is the deputy editor of *U of T Magazine*.

Past Tense

Long before still images gathered into reels,
faked and raked movement across canvas screens,
before our minds grew magnetic, and we unfurled
how the unseen tether held Earth to its satellite,
and polished silver appliances skated from
open-mouthed factories, and oven-baked bricks
mirrored unshaven bi-pedal ambition,
our cave-dwelling stencil footprint grazed along
wildfire-lit walls, grew into centuries blossomed
with hieroglyphs where meru log boats and reed
ships oiled with bronzed-back oarsmen plied
aged seas in half, reaching Tyre and other
hoary-named lapsed lands flung to the known-world's
ends, and returned soaking with Nile sun, cattle,
wares, and slaves. Long before we chipped sandstone
for spearheads on this winged orb where there is a
place on the page for everyone to create their own hue,
our hands reached where stone sparked
the ground's thermal layers, and lumps
of pyrite ignited bullets through wheellock
pistols and the brass brazzle luster of cocked guns
sang with firecracker staccato, and well before
the butcher's stick knife turned pig to ham
and we dried crystalline stinging sea salt to preserve,
pickle, cure, and smoke-hang animal flesh, before
the anthology of constellations and running down
savannah prey, there was a terrene syllable which
grabbed the first carved domino, and firmed it in place.



MICHAEL FRASER (BEd 2000) won the 2016 CBC Poetry Prize. His latest book is *To Greet Yourself Arriving*. "Past Tense" placed second in CV2's two-day poem contest in 2015.

EVERY ALUM HAS A STORY. TELL US YOURS.

John Rothschild is a Uof T grad with a fondness for numbers. He's an accountant by trade who loves music, travel and learning languages. He helped grow a food-service business to 1,250 restaurants across Canada. And, over the past 15 years, John has mentored hundreds of Uof T students.

John is making an impact and Uof T alumni everywhere are doing the same. He's part of something bigger and it's time to share that story with the world. Under the direction of an expert panel—led by Professor Shiri Breznitz, an economic geographer at the Munk School of Global Affairs, and Professor Vivek Goel, Vice-President, Research and Innovation—our first-ever Alumni Impact Survey will measure the global contributions of our alumni to tell a deeper story about us all.

**Learn more and take
the Alumni Impact Survey
at uoftimpactsurvey.ca**



UNIVERSITY OF
TORONTO

All About Alumni

“It wasn’t until I was in my teens that I came to understand he was internationally renowned for hunting Nazi war criminals”

Alexander Nathan on his grandfather Sol Littman
p.58



Toronto city manager
Peter Wallace

Toronto’s Top Money Man

City manager Peter Wallace talks tough with politicians on taxes and spending

ARGUABLY MORE THAN ANY OF HIS PREDECESSORS, Toronto city manager Peter Wallace (BA 1980 New College, MA 1981) has inserted himself most visibly into the endless debate about how a sprawling 33,500-employee municipality should, well, make ends meet.

Soon after he took the top job, in 2015, Wallace – the former top civil servant for the Province of Ontario – began warning the mayor and members of council that they were running up the municipal credit card, and that the pattern of city

expenses and revenues was approaching unsustainable levels. He circulated a PowerPoint deck with a pointed graphic showing an iceberg in profile, its submerged nether regions representing billions of unfunded commitments. He told the politicians to brace for a long-term fiscal plan meant to encourage them to raise taxes or reduce spending or a combination of both – something Toronto councillors notoriously avoid. Wallace delicately refers to this most political of choices as “the gap between service aspiration and the financial capacity to deliver.”

One day in February, the slight 59-year-old runner sat in his City Hall office and pondered the unfamiliar business of reading politicians the riot act in public – an always precarious position for the civil servants who report to them.

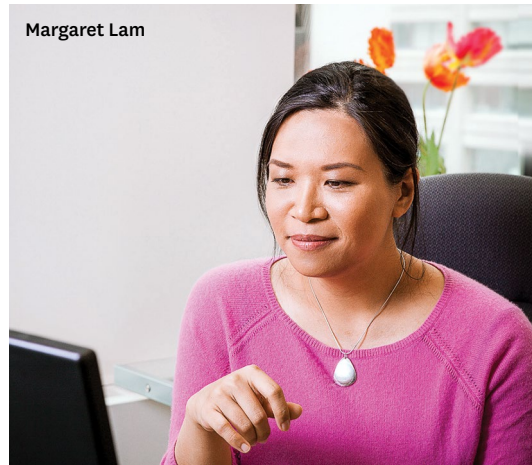
“It’s a different role,” muses Wallace, picking his words carefully. In his previous job, as Ontario’s cabinet secretary, he ➤



The most famous Ticketmaster showdown was with Pearl Jam in 1994. The Seattle rockers swore not to use the ticket giant during their Vs. tour – but ended up locked out of mainstream venues and forced to cancel most tour dates

Music to the Ears

Margaret Lam's company aims to reduce ticket prices for concertgoers



Margaret Lam

TICKETMASTER has what's been called an "iron lock" on the event ticket business – to the dismay of concertgoers who aren't wild about their exorbitant service fees. In recent years, companies such as Eventbrite and Ticketfly have been playing David to this longstanding Goliath. Now there's another one: BeMused Network, an online hub that seeks not only to reduce ticket prices, but to provide technology tools designed and priced specifically for what founder Margaret Lam (BA 2008 UC, Master of Information Studies 2011) calls "the performing arts ecosystem: artists, patrons and presenters – and eventually bloggers, volunteers and local businesses."

A trained pianist, Lam studied ethnomusicology and initially considered becoming a music librarian. But grad studies in Library and

Information Science inspired her to take her love of the arts online: hence BeMused Network, conceived four years ago. Artists who sign on can use the network's channels to promote their events; the network features an eclectic mix of acts, including classical, jazz and theatre. Patrons can buy tickets without having to worry about registration and, of course, large surcharges.

But Lam wants the network to do more: connect interested venues, critics and even donors with artists, for example. She believes technology can be a great tool for fostering meaningful connections – especially in the arts, where performers are often siloed by discipline. "At U of T I learned that technology has to be built for specific needs and not for its own sake. And the arts sector's needs are unique." – **CYNTHIA MACDONALD**

Who's on Stage?



Olivia Shortt

Many BeMused Network artists have U of T links. Here are a few.

Ron Davis (BA 1978, MA 1987, PhD 1993) is a jazz composer and pianist. He once practised law, and was a U of T French prof in the '90s. Lam says Davis is the "perfect example of an artist who's attracted to our platform: forward-looking and curious; well-steeped in his own art, but knowledgeable about the outside world."

U of T master's student **Olivia Shortt** (BMus Perf 2014, Adv Cert Perf 2016) is a saxophonist of Ojibwe and Irish descent, who hails from Nipissing First Nation. In June, she will be producing *Tales from Turtle Island* in celebration of Canada's 150th birthday.

Mike Murley is a professor of jazz at U of T, and Juno Award winner. In March, he helped composer **Shannon Graham** (BMus Perf 2011) and others bring their dreams to life with "Tales of the Unconscious," compositions emanating from the sleeping mind.

➤ could fire off his warning shots behind closed doors. But because city managers report to council in public, Wallace no longer enjoys the luxury of discretion. "I don't believe I should provide advocacy," he says. "Your agenda is the agenda of excellence." Still, it's a tough message.

Wallace is known around City Hall as a policy nerd with little patience for sloppy reasoning. He comes by his understanding of government honestly: Determined from his teens to work in policy, Wallace enrolled at U of T in 1976, studying political economy and then public administration, with the likes of political scientist C.B. Macpherson and economist and public servant Douglas Hartle.

After graduating, Wallace soon began working for the Ontario civil service, where he remained until 2014. When he stepped away for a teaching gig at U of T's School of

Public Policy and Governance, Wallace had gained experience with a wide array of policy files, from energy to wildlife to trade policy. (He had led the province's investment in the auto industry after 2008 and advised Ontario during its transition to the HST.)

Wallace insists – and it is not difficult to believe – that he draws on the public administration skills he learned during his master's degree every day he comes to work. He quickly reels off a description of how he evaluates policy problems, filtering them through lenses of economic, governance, legal and political impact. All the while, adds Wallace, he keeps an eye trained on dissidents within the civil service and public because, as he noted, "they have some insights that are really important. You've got to pay attention to groupthink. You can't make up your mind and exclude the critics." – **JOHN LORINC**

OVERHEARD



I want this campus to be a star when it comes to the Sri Lankan Tamil diaspora, its culture, its language, its perspective in the world. The time of fighting is done, and I truly believe that our people can now come together over a sense of pride in our shared culture and our history.



Ravi Gukathasan (BSc 1982 UTSC, PhD 1986), who recently gave \$2 million to expand Tamil Studies at U of T Scarborough, quoted in *Toronto Metro*, Jan. 13. Gukathasan is CEO of Digital Specialty Chemicals Ltd.





In March, Canadian petitions on Change.org included extending parental leave to 18 months; reversing a decision to ban pit bulls; and bringing back the name SkyDome



Benjamin Joffe-Walt

Be the Change

This former human-rights journalist now helps run the world's largest petition website

IN 2004, Benjamin Joffe-Walt and a photographer snuck into the Darfur region of western Sudan to meet with rebel soldiers in the desert to investigate claims of mass violence. He says it was one of the riskiest things he ever did during his eight years as a journalist, but it led to award-winning work on the Darfur genocide and ran in such newspapers as the U.K.'s *Sunday Telegraph*. These days, as one of the top executives at Change.org, Joffe-Walt's pursuit of social justice is less dangerous, but no less passionate.

"If you'd told me 10 years ago that I'd be running HR at a company with offices in 18 countries, I would have laughed," says Joffe-Walt (BEd 2003) of his job at the world's largest

petition platform. Despite this considerable career pivot, though, his underlying ambition is the same as when he was a journalist, and before that, a student activist: driving positive social change. "The most significant moral question for anyone with privilege is, 'What are you going to do with it?'" he says. "A turning point for me was being introduced to ways of doing something positive with that privilege."

While earning a bachelor of education at OISE, Joffe-Walt joined activist groups fighting racism and protesting the Iraq war. But over time he shifted to journalism as a vehicle to expose injustice. He worked for major media across Africa and the Middle East, reporting on human rights issues such as the struggles of Rwandan Hutu refugees.

When Joffe-Walt joined Change.org in 2010, it was a blogging platform where contributors wrote about social justice issues, and he was the human rights editor. Since then, he's held several senior positions – including communications director, chief of staff and now "chief people officer" – as the organization evolved into an online petition site.

Anyone can start a Change.org petition, collect signatures and then try to engage decision-makers in meeting their demands. "Change.org has been successful because of the simplicity of our focus," says Joffe-Walt. The site has more than 150 million users and claims more than 20,000 petitions have been victorious, including one by Nobel Peace Prize laureate Malala Yousafzai, who collected more than one million signatures in support of 12 years of education for girls in the world's poorest countries.

Though he's no longer trekking around the globe's most dangerous places to document injustice, Joffe-Walt is confident that he's still making a difference. To the critics of Change.org's "clicktivism," he says you shouldn't measure the success of an activist or social-change organization by how perilous their work is. "Judge us by what's been changed or accomplished in the world, not by how easy we've made it for people to participate." – **MEGAN EASTON**

Making a Murderer



Kingston Penitentiary

Days before Sarah Gadon finished filming the screen adaptation of Margaret Atwood's *Alias Grace*, she shared a photo on Instagram of a worn marble staircase inside the Kingston Penitentiary. "To think that she walked these stairs," Gadon wrote, referring to Grace Marks – the inspiration for Atwood's novel – who spent some 30 years imprisoned there.

Gadon (BA 2014 Innis) plays Marks in a six-hour miniseries set to air this fall on CBC in Canada and Netflix internationally. Shot in Toronto and around Ontario from August through November, *Alias Grace* tells the true story of Marks's conviction for the brutal murder of her employer

and his housekeeper in 1840s Upper Canada. She was later exonerated for the crime.

Gadon, who has been acting since childhood, continued to work while studying part time for her cinema studies degree at U of T. She has gained widespread recognition for her roles in two David Cronenberg films: *A Dangerous Method* in 2011 and *Cosmopolis* in 2012. While filmmaker Cronenberg (BA 1967 UC) doesn't direct this mini-series, he does have an undisclosed acting role. Fellow alum Margaret Atwood (BA 1961 Victoria) also makes a cameo appearance.

– **MEGAN EASTON**



A blue whale weighs up to 180 tonnes. Its tongue can weigh as much as an elephant, and its heart as much as a car, according to *National Geographic*

MY DEFINING MOMENT AT U OF T

Allies in Her Corner

U of T faculty and staff had this alum's back, which enabled her to thrive

By Lindy Ledohowski
(BEd 2000, MA 2003, PhD 2008),
as told to Sharon Aschaiek



AFTER I COMPLETED my master's degree in English, Prof. Russell Brown told me U of T Scarborough was seeking an instructor for a new course on critical thinking about poetry. The course would launch the following academic year, when I would start my doctoral degree in English-Canadian literature – so I jumped at the opportunity.

The English department chair resisted the idea – she was skeptical that a first-year doctoral candidate could take courses, apply for grants and fellowships, prepare for exams and teach a course. She thought it would be setting me up to fail. Brown went to bat for me, confident I could handle it.

I got the job, and I ended up teaching that course eight times over three years. I also helped develop a course on critical writing about literature, and created two teaching manuals. In that first year at UTSC, I even won a teaching award.

It meant a lot having Brown – who would become my doctoral supervisor – and the English department chair look out for my best interests. Also, my pedagogical experience at UTSC heavily influenced the development of EssayJack, the web platform I co-created for helping students write better essays. As an entrepreneur, I have a strong sense of resilience, which I developed at U of T – I learned if I found myself in a demanding situation, I could rise to the challenge.

Out of the Depths

Blue whales fascinate us not only because they're the world's largest animal, but because they're elusive, rarely emerging from the depths. So when the corpse of an adult female blue whale washed onto Newfoundland's west coast in 2014, it presented an extraordinary research opportunity for Burton Lim (BSc 1984, PhD 2007). "It was interesting to see that the anatomy of such a big animal was essentially the same as smaller species of mammals like bats and rats, which is what I normally study," says Lim, assistant curator of mammalogy at the Royal Ontario Museum – which is showcasing the animal in its new exhibition, "Out of the Depths: The Blue Whale Story." Lim worked under Mark Engstrom, a ROM senior curator and a U of T ecology and evolutionary biology professor, to prepare the exhibit's main features: the whale's skeleton and heart, and information on its retrieval, evolution, biology and endangered status – its numbers have dropped to about 20,000 from an estimated 300,000 during the 19th century. To better understand this threat of extinction, Lim – who has conducted mammalogy research and public programming at the ROM for 31 years – is helping to sequence the whale's genome. "We will be able to investigate the evolutionary adaptations of whales to their aquatic environment," he says, "and get better estimates of previous and current population sizes." – **SHARON ASCHAIK**

Blue whale carcass on Newfoundland's west coast in spring of 2014





FIRST PERSON

Lessons from My Grandfather

The late Sol Littman's fight against anti-Semitism is a reminder "to not let history repeat itself"

MY GRANDFATHER, and self-appointed family patriarch, Sol Littman died earlier this year at age 96.

When I was young, he was the loving man who taught me to play table tennis and golf, and engaged me in achingly slow games of chess via email, both of us with boards set up next to our computers. It wasn't until I was in my teens – and he was in his 80s – that I came to understand he was internationally renowned for hunting Nazi war criminals, and had dedicated his life to social justice and anti-discrimination.

The son of poor Jews from Poland and Lithuania, Sol grew up in Toronto's Kensington Market and paid his way through U of T by working at Tip Top Tailors. He earned a BA from University College in 1945, followed by a degree in social work in 1953.

He chose his career so he could help address the poverty and the systemic anti-Semitism he, his family and the Jewish community experienced in Toronto in his youth. He was also motivated by Canada's discriminatory – and ultimately tragic – restrictions on Jewish immigrants between 1933 and 1945.

In the '50s and '60s, he worked for the Anti-Defamation League in New York, Omaha and Detroit. He returned to Canada in 1968, and headed B'nai Brith's League of Human Rights, which successfully pressured Toronto's Granite Club to abandon its anti-Semitic membership practices.

In 1971 he turned to journalism: he edited the *Canadian Jewish News*, became community relations editor at the *Toronto Star* and reported for the CBC, producing features such as his 1974 award-winning investigation into Canada's dreadful prison conditions.

Sol's 1983 book, *War Criminal On Trial*, was based on his reporting of the arrest, extradition and trial of Helmut Rauca, a Nazi war criminal who spent 30 years undetected in Canada. The book ruffled feathers over the questions it raised about Canada's commitment to bringing Rauca to justice. But it was Sol's 14 years as Canadian representative of the Simon Wiesenthal Center – whose mandate was to track down Nazi war criminals – that caused controversy.

The centre's campaign to get the Canadian government to act against named alleged war criminals led Prime Minister Brian Mulroney in 1985 to appoint the Deschênes Commission of Inquiry into war criminals in Canada, to which Sol contributed evidence.

But, dissatisfied with the commission's findings and undeterred by fierce criticism from some quarters about his evidence and motives, Sol spent 12 years researching his book *Pure Soldiers or Sinister Legion* (2003). The book questioned the wartime role of the German-recruited Ukrainian Waffen-SS division, suggesting that it was not the benign force as had been claimed but instead had committed war crimes (though Sol was extremely careful not to accuse every division member of crimes).

Sol also shed light on Canada's compliance with the British government's desire to "export" this division and other alleged war criminals throughout the Commonwealth between 1950 and 1955. The history and issues raised by the book are still hotly disputed.

He continued writing and teaching until shortly before he died. Sol inspired me to attend U of T, and taught me that growing older does not inherently make one more conservative. The anti-Semitism, racism and nationalism Sol fought against are resurgent, but today's vitriol is also directed at other scapegoats. His work is a reminder for us to be vigilant and not let history be repeated.

Sol's old friend Sam Sniderman once told me that my great-grandmother had warned Sol to study hard or he would "end up a bum like that Sam Sniderman." Sam, also formerly of Kensington Market, became the music industry legend Sam the Record Man and was awarded the Order of Canada in 1976. Such bums he and Sol were!

Alexander Nathan (BA 2010 New College) works in the division of Human Resources and Equity at U of T.



How do you become an official Toronto busker? Candidates have seven minutes to perform a three-song medley. 75 licences are given to those with the highest scores. Acts involving trumpets, electric guitars or drums are not allowed – too loud!



Sebastian Brown

Fine, but...who moves a piano to work? I'm not original. There's another guy in New York who does it with a grand piano. He used to do it with an upright and went through one piano a year, because he'd play in the rain too. I don't do that, because I've only got one piano. And there's also another guy who'd strap his piano on his back. Well, I wasn't going to do that! I'm not that crazy – and my friends Billy Kalantzis, Alexandre Piché-Abe and Joel Dalton have all helped me at various times.

And why so far? I used to store it in a bar close by, but I got kicked out and had to get storage space near the Don Valley Parkway. My friend Billy agreed to help me move it downtown. The first time we tried, we got stuck on a pedestrian walkway with people trying to get around us. It was very embarrassing. I remember one guy yelling: "Holy Moses, it's called hiring a piano mover!"

Any close calls? Oh yeah, especially that first week, until we started to use ratchet straps so the piano wouldn't fall over. But every time you push it you're nervous; every bump freaks you out. Billy decided it hurt his back too much, so Alex started helping me. It got to the point where he and I didn't need to communicate, we knew that road so well. I can tell you where every crack, pothole and sewer grate is.

Why did you decide to play ragtime? I think everybody recognizes it, even if they don't know from where. It's deeply embedded in our cultural and historical memory. I was in high school when I first heard it, but it still sounded familiar. Because Scott Joplin died in 1917, his work is in the public domain, so I could go to the United States Library of Congress website and get most of it there. I just started to learn one song after another.

After all the difficulty of pushing a 360-kilogram instrument to work, did you ever think: hmm, maybe I should have taken up the recorder? No, because you see people busking with small instruments like that all the time. It's a bit more difficult, but it garners more attention because of how unusual it is. Also, when you get your city permit, you're not allowed to have an amplifier. So nobody can hear you unless you're playing an instrument as large as a piano: it's so big, the sound carries all the way down the street. Overall, the reaction I get is just – wow! A piano? Why? And how?

60 SECONDS WITH

Sebastian Brown's Sidewalk Saloon

U of T alum pushes his piano two kilometres to play ragtime on Toronto's streets

Moving is a pain, but moving a piano is another order of pain altogether. That doesn't matter, though, to **Sebastian Brown** – who earned a BA in linguistics in 2014: for the last two summers, the Toronto busker has regularly pushed his upright piano over a two-kilometre stretch to play ragtime tunes near Union Station. This summer, Brown will once again treat startled onlookers to an infectiously happy menu of Scott Joplin songs – played at his very own sidewalk saloon. **Cynthia Macdonald** caught up with him recently.

Where did you get the idea to do this? In 2012, in the run-up to the 2015 Pan Am Games, organizers put pianos on the street, each one painted to represent a different country. Nobody would play the one at Union Station because of the heavy construction there. But I found that if I just waited until 5 o'clock the construction workers would go home, and I could play without any interruption. When they took the piano away, I decided I had to do it myself.



Albert Prebus (left) and James Hillier working with the electron microscope in 1938

SEEING NEW WORLDS

1938

Two U of T graduate students built North America's first working electron microscope

In April 1938, U of T grad students James Hillier (BA 1937 UC, MSc 1938, PhD 1941) and Albert Prebus (PhD 1940) showed their physics professor, Eli F. Burton (the moving force behind their project), what they'd been building for the last four months: North America's first working electron microscope. Cobbled together with parts they machined themselves and sealants made by melting rubber with Vaseline, it could magnify objects 10,000 to 20,000 times (ordinary microscopes top out at 2,000 times) and was going to change fields from engineering to medicine.

Although German scholar Ernst Ruska later won the Nobel Prize for discovering the basic design principles earlier in the '30s, "the contribution of Toronto was to invent a practical electron-focusing system that actually worked," says Stephen Morris, U of T's J. Tuzo Wilson Professor in Geophysics. During the Second World War, for example, U of T physicists measured molecule sizes in an effort to build better gas masks.

Eighty years later, being able to do chemical analyses at atomic scales has contributed to the explosion in nanotechnology, says Prof. Doug Perovic, U of T's Celestica Chair in Materials for Microelectronics. For example, observing how titanium oxide changes at nanoscopic levels inspired U of T researchers working on the "artificial leaf." And in medicine, "electron microscopes were key in describing many of the structures that make up cells," says Prof. John Rubinstein, U of T's Canada Research Chair in Electron Cryomicroscopy, who, with his research group, has determined the structures of numerous proteins in cells, which may help with drug discovery efforts.

Prebus went on to an academic career, building a second microscope and becoming a respected expert on the atomic structure of materials. Hillier launched the first commercial electron microscopes with electronics company RCA, helping the technology spread around the world. - JANET ROWE

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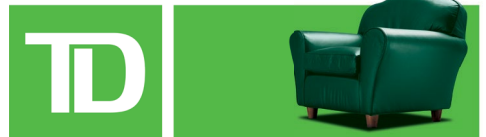


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Thursday, June 1

6:15 p.m.

Great Museums of Lake Erie
Mary Redekop

The Role of Self-Knowledge in Well-Being
Prof. Erika Carlson

Friday, June 2

12 p.m.

Toward Better Treatments for Alzheimer's Disease
Prof. Graham Collingridge

Lee Strasberg, Marlon Brando and the Sound of Authenticity
Prof. Jacob Gallagher-Ross

3:15 p.m.

Canada's Odyssey
Prof. Emeritus Peter Russell

Stories from the Time before Vaccines: An Antidote to Anti-Vaccinism
Dr. Natasha Sarah Crowcroft

Sleep Check-Up: Feel Better, Think Clearly, and Live Longer
Dr. Colin Shapiro

6:15 p.m.

Work and the Quest for Meaning
Prof. Scott Schieman

Fatal Attraction: The Lure of Literary Villains
J. Barbara Rose

Saturday, June 3

9:45 a.m.

Exercise Programs for the "Un-Fit"
Prof. Darlene Reid

Making Sense of Mixed Health Messages in the Media
Prof. Laura Rosella

Colonialism and Canadian Confederation
Prof. Brian Gettler

2:30 p.m.

Scientific Uncertainty in a Post-Truth World
Prof. David Bailey

Topics in Engineering Today
Profs. Penny Gilbert and Marianne Touchie and Prof. Emeritus Ron Venter

Sexuality and Sport
Prof. Caroline Fusco

The World Is Charged with Faith and Beauty: Three Writers, Three Visions
Prof. Randy Boyagoda

3:45 p.m.

Discovering Ghostly Galaxies
Prof. Roberto Abraham

The Curious World of Probabilities (for Young Alumni)
Prof. Jeffery S. Rosenthal