

UCalgary

Alumni magazine

IN 50 YEARS WHERE WILL WE BE?



UNIVERSITY OF
CALGARY

+ The Power of Brain Games + Drivers of Disruption + The Post-Truth Era

Grow your mind at

Alumni

weekend

SEPTEMBER 22-24, 2017

Bring your family and friends to learn, connect and play.

To help you get ready to grow your mind at Alumni Weekend,
try to answer these UCalgary brainteasers:

1

What is something that's
extinct, but you can see
live at Alumni Weekend?

SEE LIVE

2

What is the fastest in the world,
but never moves?

FASTEEST LIBRARY

3

I'm a library that doesn't
loan out books. What am I?

4

Who was the first Canadian
to undertake a long-
duration space mission?

FIRST CANADIAN

35 MILLION YEARS

5

What is upwards of 35 million years old,
but has only been around for the past 49 years?



**UNIVERSITY OF
CALGARY**

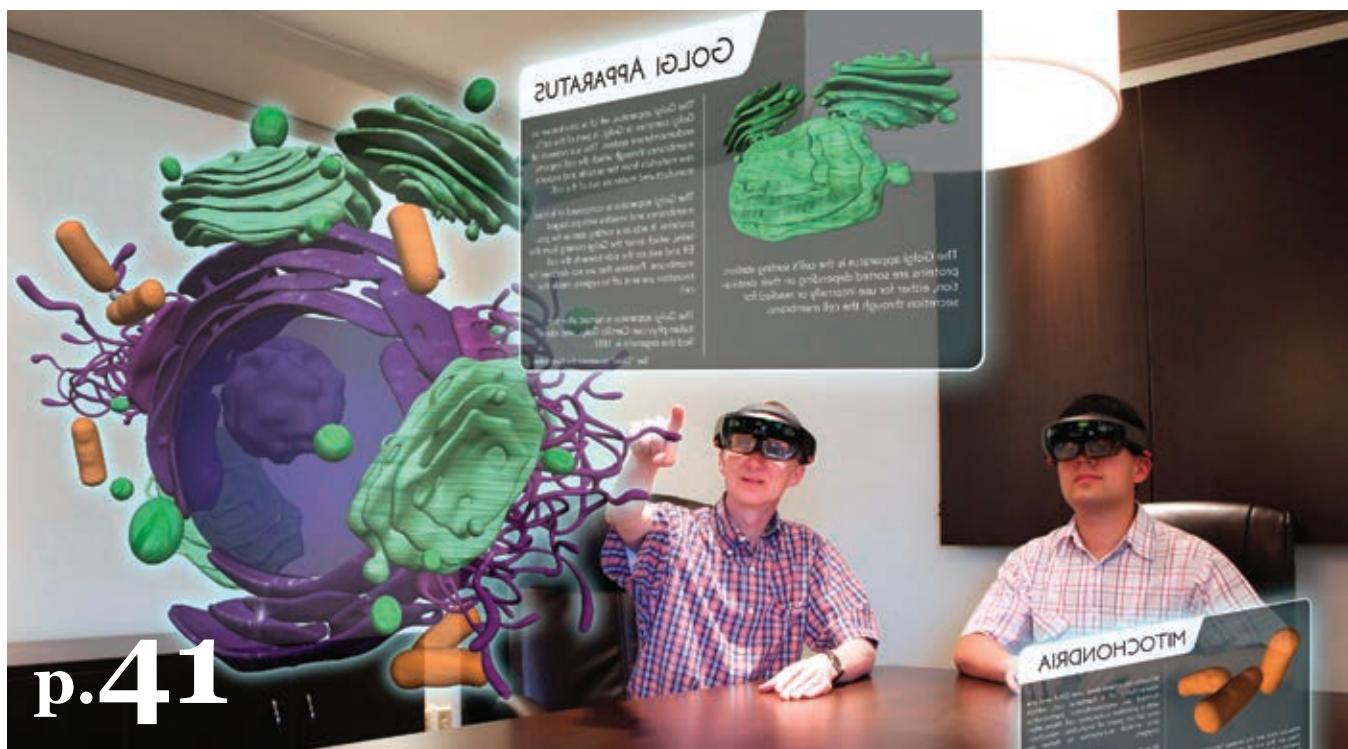
ucalgary.ca/alumniweekend

Answers:

1. Dinos. Join us for the UCalgary football game at McMahon Stadium during Alumni Weekend. 2. The Olympic Oval, which is home to the fastest ice in the world. 3. MacKinnon Library. This building, which opened in 1972, moved much of its collection to the nearby Taylor Family Digital Library. Today, the MacKinnon Library is home to Fermi Mart services and the Campus Tours Office. 4. UCalgary Challenge! Rocker. This rock, which spans 188 feet along the remnant of Space Station in 2009, has become a symbol of free expression at UCalgary, as students have painted it to express opinions, pride and protest.

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The Power of Brain Games is an enlightening story that examines the valuable skills developed by video gamers. In this photo, computer science professor Christian Jacob and Douglas Yuen, MSc'16, explore *HoloCell*, an augmented reality (AR) application that probes the inner worlds of a biological cell. The picture simulates the scene as displayed through the AR glasses.

Features

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Drivers of Disruption

It's going to be tough. Nobody said your first invention or startup would be a snap, but, with the uptick in entrepreneurship across this province, we're excited to show you the results of chutzpah and hard work.

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In 50 Years, Where Will We Be?

Chunkitecture, microbiomes, precision medicine, e-cars, geothermal sidewalks, wind farms, biogas, virtual reality, augmented reality and tomorrow's campuses give us a peek into our future.

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Gotcha! Campus Legends

Think that time you wrapped the university president's car in toilet paper was impressive? You may reconsider after reading our aspiring litany of homegrown larks that went above and beyond.

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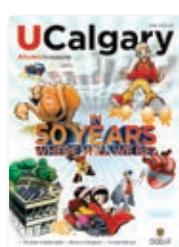
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ON THE COVER

Illustrations by Travis Sengaus

More from Alumni



et a head start on all things Alumni by diving in to one of our e-publications or bookmarking ucalgary.ca/alumni. On our home page, discover exclusive alumni news, the rundown on top university events, details on regional programming and some behind-the-scenes surprises.

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Mid-month, **Alumni News** delivers a handpicked selection of the best stories, videos and podcasts from your alma mater.



At the end of each month, we send you **Alumni Connection** — a customized newsletter packed with events.



We celebrate our alumni changemakers with our highest honour — our annual Alumni Association **Arch Awards**. Nominate someone by May 10. [ucalgary.ca/alumni/
archawards](http://ucalgary.ca/alumni/archawards)



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Be part of **Idea Exchange**, an ongoing, thought-provoking program in Calgary and our regional alumni communities that links UCalgary alumni with today's big thinkers and decision leaders.



Looking for a way to give back to the community with your fellow alumni? Get inspired right here with our **Community Impact** program. For more information, visit ucalgary.ca/alumni/volunteer

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Nancy Markley, BSc'89, MSc'95,
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A Foot in the Future

Once upon a time, humankind dreamed of a better place. Flying cars, underwater hotels, jetpacks, disposable clothing and space vacations — these were the hallmarks of yesterday's World of Tomorrow. But who hasn't thought — say, after enduring the red-lighted grind of daily traffic — that we're living in the wrong time, one that resembles *The Flintstones* more than *The Jetsons*?

And that's exactly where we stopped —

and started — when we began discussing the theme for this issue. Consider **In 50 Years, Where Will We Be?** an outbreak of tomorrow. Consulting with alumni, students, academics and other notables, we toggle between topics that include forecasts of healthy aging, artificial intelligence, precision medicine, transportation, education and future energy systems (beginning on pg. 30); brain games — the sort that see basement gamers evolve into surgeons (pg. 41);

UCalgary's tech sector and who's driving that force (pg. 12); a crackling column written by alumna and *New York Times* reporter Susanne Craig on President Donald Trump's take on truth (pg. 24); seven healthy life habits (pg. 26); and a spirited romp through UCalgary's legendary pranks (pg. 46).

If we've done it right, **In 50 Years, Where Will We Be?** will help you understand the next frontier. Spoiler alert: We like what we see. — Deb Cummings 



Imagining Tomorrow

As an active, optimistic person, my vision of Calgary 50 years from now includes an image of myself riding a bicycle from my modular, inner-city smart home to visit my grandkids (okay, great-grandkids) in the University District. And, if precision-medicine research at the Cumming School of Medicine continues at its current astonishing pace and scope, I expect by then to have a solid handle on my own genomic profile: I'll know exactly what diseases I'm susceptible to and how to avoid them.

From a broader perspective, I see our city leading the world in resource management, clean technologies and renewable energy in ways we've already begun to understand and harness for the benefit of our economy and the planet.

While the exercise of looking ahead to 2067 is nothing short of exhilarating, such a long-term focus is the starting line every single day at the University of Calgary. Indeed, everything we do here — all of our teaching and learning, our research, and our community-building — reflects our goal of preparing the next generation to steward a world that is exponentially smarter, richer, kinder, more efficient and more inclusive than the one we live in today.

UCalgary's commitment to our vision for the near future, however, will create momentum for this longer-term plan. This year, alongside our thousands of committed alumni, donors, friends and partners, UCalgary is working towards a refined strategic direction that will guide our *Eyes High* strategy over the next few years. That strategy, which underpins our ambitious \$1.3-billion fundraising initiative, *Energize: The Campaign for Eyes High*, provides the platform from which this university leverages its aspirations. It serves as a beacon for change, for elevating excellence in student experiences and research, and for building a strong community around a shared future.

Ultimately, of course, whether five or 50 years from now, the essence of this university is not defined by what powers our vehicles nor by how far big data can take us. Those advances are — not insignificantly — the healthy, progressive upshots of a university relentlessly fuelled by excellence and ambition.

In other words, in 2067, I expect I'll be saying the same thing about this institution that I do now: the University of Calgary exists for us, together, to make a real difference in the world. You have been with us on this journey, and we look forward to continuing our adventure together over the next 50 years.

Thank you.

Elizabeth Cannon, BSc'84, MSc'87, PhD'91

Energize: The Campaign for Eyes High

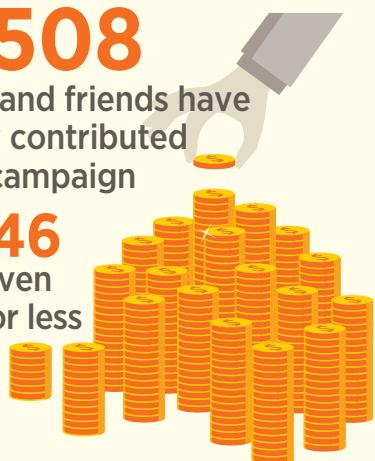
Thanks to your remarkable generosity and participation — and that of thousands of other alumni and friends — we are now more than 60 per cent towards our goal of \$1.3 billion. Thank you.

21,508

alumni and friends have already contributed to the campaign

15,546

have given \$1,000 or less



Alumni and friends from **32 countries** have given to *Energize*



8,789 alumni and friends

have made their first gift to UCalgary during

Energize



Data, Data Everywhere

Big data is on track to touch all aspects of society — and that's well in advance of our 50-year forecast. We are now living in a world where we use large sets of data to not only create predictive models and optimize business, but one where big data will benefit individuals as well. Think of today's smart watches, sensors and wearable devices that collect data on our calorie consumption, activity levels and sleep patterns. Soon, data analytics will be able to decode entire DNA strings in minutes and find new cures and better understand disease patterns. Integrating data from medical records with social media analytics will enable us to monitor flu outbreaks in real time. Extrapolate this and the



TRENDS

potential to predict the developments of epidemics and disease outbreaks is not merely the stuff of sci-fi. Big-data applications are currently used to optimize traffic flows, make financial trading decisions, foil terrorist plots and detect fraudulent financial transactions. Today, it's no longer an option not to use big data, says UCalgary computer science professor Sheelagh Carpendale. A world leader in the emerging field of information visual-

ization, Carpendale and InnoVis (her interdisciplinary graduate research group in information visualization) have succeeded in increasing accurate diagnosing of pulmonary embolisms; in recreating the serendipitous search of physical books that libraries have lost through digitization; in manufacturing a digital representation of the aurora borealis; and in identifying gaps in treatment time for stroke patients. — Jenny De Guia  



Alumni

It's not the same without a frame!

You worked hard for your degree. Display it with pride in an official UCalgary degree frame — available in a variety of styles at prices to match your taste and budget.

Get 10% off by pre-ordering your frame online and choosing to pick up at Convocation in June.

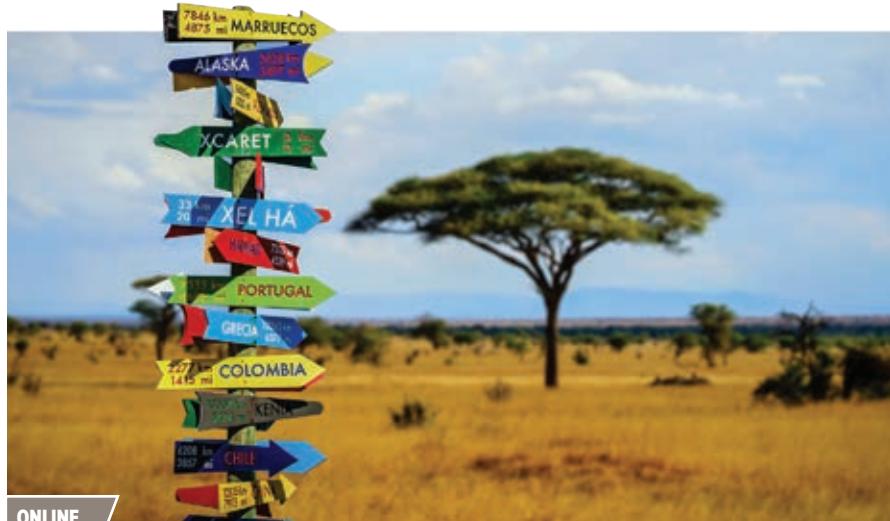
Deadline for pre-orders is May 31.

ucalgary.ca/alumni/buyframes



Calendar 2017

Connect with your fellow grads in Calgary, online and around the world. This is just a sampling of upcoming programs and events. Check out ucalgary.ca/alumni for a full listing.



ONLINE

INTERNATIONAL JOURNEYS

Need a jolt of wanderlust? Come travel with us on May 30 by logging on to our webinar series, International Journeys, featuring alumni from around the globe who will share their post-graduation journeys complete with life lessons, successes and inevitable challenges along the way. ucalgary.ca/alumni/connect



LEARN

IDEA EXCHANGE — IN CALGARY AND AROUND THE WORLD

Big ideas, alumni perspectives — a series featuring leading alumni, university and industry experts who will swap ideas on topics that matter to all of us. Come learn and grow your network! Watch for the big ideas this fall. ucalgary.ca/alumni



CELEBRATE

SAY YAHOO! AT THE CALGARY STAMPEDE

Dust off your boots and shake up your traditional Stampede experience by celebrating with UCalgary Alumni on July 6 when we combine learning with fun. Enjoy a 20% discount on admission during UCalgary Days as we tip our hats to the Greatest Outdoor Show on Earth. ucalgary.ca/alumni



VOLUNTEER

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Join your fellow alumni who like to give back to the Calgary community. Your time can make a world of difference.

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CAREER

THE UCALGARY ALUMNI CAREER PROGRAM

There's a global network of opportunity to support you on your professional journey — virtual career coaching, one-on-one sessions in-person with our in-house career-development specialist, online sessions on career development topics and more. ucalgary.ca/alumni/career



RECENT GRADS

LEARN, LAUGH, LEAD

If you graduated within the past five years, check us out. From workshops on time and money management to wellness and more, these sessions will teach you life skills that you didn't learn in class. Great company included! ucalgary.ca/alumni



CELEBRATE

UCALGARY ALUMNI ASSOCIATION'S ARCH AWARDS

Join us this September during Alumni Weekend as we celebrate the 2017 recipients of the Alumni Association's highest honour. All alumni are welcome. ucalgary.ca/alumni



CELEBRATE

ALUMNIGHT

UCalgary Alumni welcomes the Class of 2017 in a post-convocation get-together on June 9 that will be full of impactful networking, socializing and fun. ucalgary.ca/alumni



MARK YOUR CALENDARS

ALUMNI WEEKEND

Bring your family and friends and join us for three days of mind-growing and family-friendly activities — Sept. 22 to 24! ucalgary.ca/alumniweekend U



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The Learned Ladies, by Molière. School of Creative and Performing Arts, 2016.
Photo by Citrus Photography.



Xia Zhang, City of Calgary

About 600 people are slated to attend a September conference that aims to explore how a walkable urban design can create health, environmental and economic benefits

If the future we spend time imagining is the one we're likely to get, here's what you should invest in: walking shoes.

In 2067, the one common denominator that will knit together our urban core in communities such as Calgary's East Village, the Beltline and Victoria Park will be something much more pedestrian (sorry, pun intended) than flying cars — it will be walking and biking.

"The impact Calgary's LRT Green Line (pg. 34) will have on people's transportation patterns will be enormous, and the walk-bike routes that will connect to that will greatly increase the walkability in this city," says the City of Calgary's senior architect of

urban design, David Down, MEDes'88.

A chance to amble through some of Calgary's up-and-coming urban neighbourhoods, as well as along Calgary's Riverwalk, the Great (formerly Trans Canada) Trail, the Stampede Grounds, Chinatown, Inglewood's Music Mile, the University District and others, is a major draw for Walk21 Calgary, Sept. 19-22.

Hosted by the University of Calgary, this 18-year-old international conference will feature scores of presentations and keynotes from walkability experts who will be here to discuss, debate and design our walkable futures. Attracting citizens, urban planners, health-care professionals,

local leaders, politicians and academics, this conference also includes "walkshops" that Down and his committee are currently designing. Ranging from 60 to 120 minutes in length, these guided walking tours are a chance to, literally, walk the talk.

Exposing people to Calgary's emerging walkable design is one of the conference's themes, adds Down, who himself walks about 20 km a week, which is why the workshops committee has partnered with Calgary's local chapter of Jane's Walk (inspired by Jane Jacobs). For details on the program, registration and volunteer opportunities, visit ucalgary.ca/walk21calgary.

— Deb Cummings **U**

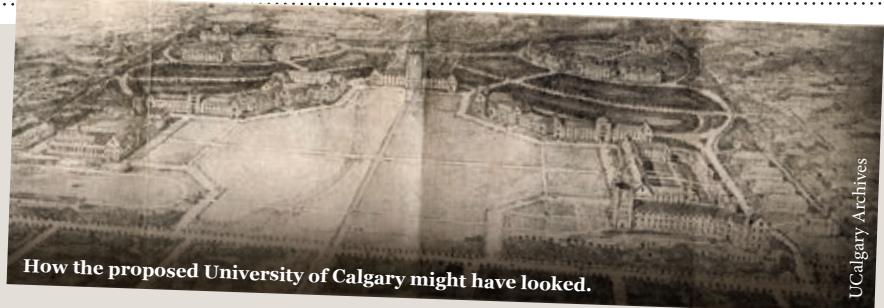
Little-Known Fact

What do the University of Calgary and the Calgary Stampede have in common? They were both established 105 years ago.

But haven't we just spent the last year celebrating UCalgary's 50th birthday?

Yes indeed, but archives reveal an aborted attempt at establishing a University of Calgary that's a little-known chapter in this city's early history.

Plans for a local university were hatched in 1910. Due to the province not wanting competition against Edmonton's then-new University of Alberta, Calgary's school couldn't get degree-granting status, so it ended up taking the official name



How the proposed University of Calgary might have looked.

UCalgary Archives

Calgary College. However, there was still support for a University of Calgary, backed by pioneers like Lord Strathcona (who pledged \$25,000), James Shouldice and A.E. Cross. In fact, W.J. Tregillus donated 160 acres in what is now Strathcona Park for a campus.

The school held its first classes in October 1912 at what is now called Memorial Park Library. That first year, 217 arts and 51 law students attended classes — arts

students paid as little as \$10 per term, plus additional fees. A church hosted the first year's "closing exercises."

Further efforts to upgrade to a university were fruitless, and Calgary College folded in the summer of 1915 due, in part, to the outbreak of the First World War, which saw many of its students enlist.

It would take another half-century before the dream of a University of Calgary finally took hold for good. — Alex Frazer-Harrison **U**

Colonizing Mars



What would a colony on Mars look like? What would be the design considerations? How do you make it inhabitable?

These challenges are exactly what's being explored in a new studio course in the Faculty of Environmental Design.

Developed in conjunction with the Harvard Business School Aerospace Alumni Group, this course looks at designing the short-term living and working space for the early missions with four to six crew members, and then further out at a larger research base housing 50 to 100 people.

The Mars Studio has 12 students enrolled this semester and features speakers including Chancellor Robert Thirsk, BSc'76, LLD'09. The course started with three weeks of research on the conditions of Mars, how humans have colonized remote lands in the past and how astronauts live in space.

Current projections suggest a trip to Mars may be possible in about 15 to 20 years, so courses like this could provide insight into what a real colony may look like. Future offerings of the Mars Studio could include building prototypes, research and design. — Sean Myers 



Seeing Science Fiction History in a New Light

Literary historians typically agree the seeds of sci-fi were planted by the pioneering likes of Jules Verne and H.G. Wells. But our understanding of that history could be in for a radical revision

RESEARCH

thanks to an SSHRC-funded research project led by English professor Stefania Forlini that seeks to digitally explore the depths of a collection that was gifted to the university in 2002.

Housed in Archives and Special Collection within Libraries and Cultural Resources, the Bob Gibson acquisition is considered to be one of the largest science fiction research collections in the world and an invaluable source for scholars. With

more than 35,000 genre-related items — books, pulp magazines and rare popular periodicals dating back to mid-1800s — exploring its scope is almost impossible.

Which is precisely why Forlini collaborated with a computer science professor from Scotland to develop the *Speculative W@nderverse*, an online visual explorative tool that allows researchers and fans, alike, to explore its stories.

Intrigued by this enormous collection? Read the complete story online at ucalgarymag.ca. You can also request to view the material on the 5th floor of Taylor Family Digital Library by calling Special Collections at **403.220.3608** or email speccoll@ucalgary.ca. — Heath McCoy 

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DRIVERS OF DISRUPTION

by Mark Witten

CANADA'S TECH SECTOR
IS A CORNERSTONE OF OUR
KNOWLEDGE ECONOMY
AND A HUGE DRIVER
OF INNOVATION

HOMEGROWN



George Shimizu, a professor in chemistry, is working with people from across the industry spectrum — scientists, engineers, business analysts, political scientists — to collaborate on new carbon-capture techniques. They recently had a breakthrough developing a metal-organic framework (MOF) that works like a solid sponge and traps excess CO₂ emissions at the source of combustion.

Shimizu compares it to a baseball glove that catches the CO₂ like a baseball. He has partnered with private company Bow Valley Innovations to bring this to market.



Solar Biocells is an innovative bioengineering startup that came straight out of UCalgary labs. Co-founders are geoscience Prof. **Marc Strous** and postdoc **Christine Sharp**. They have designed a natural mechanism to capture and convert CO₂ into biomass.

The future of Canada lies in entrepreneurship and technology. Historically, Canada has been a resource-based economy, and that isn't going to vanish — however, the need to supplement natural resources with technology is undeniable. In 2015, Canada's tech sector contributed \$117 billion to our economy and employed some 864,000 Canadians. It's an explosive industry that spans the country, creating job opportunities from coast to coast.

That's how **Peter Garrett**, BSc (Eng)'80, president of Innovate Calgary, UCalgary's technology-transfer and business-incubator centre, sees the future and the crucial role his organization plays in helping researchers and entrepreneurs make the leap from research idea, to innovation, to startup business. Innovate Calgary offers programs and services that help bridge the gap between research discovery and innovation, supporting early phase startups.

"There is tremendous leverage in the technology market, and a lot of value and wealth are created from research endeavours," says Garrett, who led a Nortel Networks team of

1,200 engineers and scientists on four continents in developing and deploying more than 50 new products. He was also CEO of Global Thermoelectric, a fuel cell company.

"From an economic-development perspective, creating value from research is one of the most important strategies for any jurisdiction. That's true for Canada and for Calgary, where the need for diversification is greater now than it has ever before."

Innovate Calgary saw 600 new clients last year, an 800-per cent increase from five years ago. Clients have included: Parvus Therapeutics Inc., developer of a new class of autoimmune disease drugs; Diversity Leads, a social-innovation

consulting firm; and MOMS Link, a peer-support network that combats postpartum depression (see page 14). Beyond providing the basic knowledge and support to help people build a business, Innovate Calgary also connects researchers and entrepreneurs with potential investors or licensing partners. "Innovation is a contact sport," says Garrett. "You need interaction between researchers, entrepreneurs and investors, and we bring these people from different spheres together."

Startups and small companies are the growth engine of the economy, creating new jobs at a much faster rate than older, traditional businesses. Garrett sees the university as fertile ground for unlocking the entrepreneurial potential of both student and faculty researchers, that, in turn, will create more new businesses that can flourish and grow.

"I'm bullish about the future," he says. "I'm constantly amazed by the capacity of this younger generation, their creative thinking and technical excellence. We old dogs have to create the environment and innovation culture for the younger generation to realize their dreams."

"You need interaction between researchers, entrepreneurs and investors, and we bring these people from different spheres together."

The Startup Upstarts

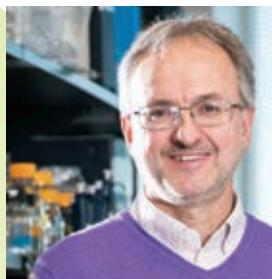
Who's behind some of the cutting-edge talent that's pouring out of UCalgary



Victoria Ross, Third-Year Student, Haskayne School of Business

aGRO Systems

Don't snicker at those Grade 9 science experiments, for that's exactly where the roots of Victoria Ross's **aGRO Power Pond System** company were sown. Between recent entrepreneurial classes at the Haskayne School of Business and the Hunter Centre's Summer Incubator Program, Ross's original idea for a natural pond filtration system has morphed into a multidimensional manure-management system complete with water purifier, power generator and organic fertilizer producer. A large on-farm pilot is planned for June and operations will launch in May 2018, after Ross graduates from Haskayne with a BComm degree.



Pere Santamaria

Parvus Therapeutics Inc.

Pere Santamaria, a research scientist and professor in the Cumming School of Medicine, founded this bold biotech startup to translate his discovery of a new class of nanoparticle-based drugs to treat autoimmune diseases such as Type 1 diabetes and multiple sclerosis. This new class of drugs (called Navacims) reprograms disease-causing white blood cells by tricking them into actually suppressing the disease in a highly specific way, without compromising general immunity. **Parvus Therapeutics Inc.** is named after the Latin word for small, as in nanoparticles, but Santamaria's long-term goals are big. If Parvus succeeds in treating Type 1 diabetes in human clinical trials, Santamaria wants to develop drugs for all 100-plus chronic inflammatory disorders affecting humankind.



Nicole Letourneau

MOMS Link

Nursing professor Nicole Letourneau co-developed **MOMS Link** — a phone-based, peer-support network — to connect mothers wanting to combat postpartum depression. In 2010, MOMP Link first partnered with Sykes Assistance Services to pilot the program in New Brunswick. What happened next was a mind-blower. After 12 weeks, 89 per cent of the participating moms were no longer depressed. Innovate Calgary helped Letourneau commercialize the program through a licensing agreement that allows Sykes to now offer the program in every province and territory across Canada.

SMARTER TRAVEL

There are countless ways to travel but few are as illuminating and as satisfying as a UCalgary Travel Study trip. From your fellow travellers to a local expert in his or her field, the depth and scope of next year's trips are unbeatable. Whether Spain, Iceland, Venice or India is on your bucket list — you'll likely find your dream destination on our roster.

 UNIVERSITY OF CALGARY
Alumni

Discover more by contacting Kevin Gardner at: kevin.p.gardner@ucalgary.ca or 403.220.3398



Rebecca Sullivan

Diversity Leads

Rebecca Sullivan, UCalgary English professor and co-ordinator of the university's Women's Studies program, founded **Diversity Leads** after companies kept asking her to help with workplace equity, diversity and inclusion strategies. What she saw was too much token diversity and equity strategies constructed around having employees fit their existing culture. Diversity Leads pushes company leaders out of their comfort zones to build a better culture that is truly more diverse and inclusive, which becomes a more productive workplace that emphasizes meaningful inclusion. Sullivan credits Innovate Calgary for sage advice and support on how to build an effective business with an academic edge.



Ryan Lewinson, PhD'15

Glacier RX

At just 28, Ryan Lewinson has already one PhD in biomedical engineering from UCalgary, and is now back in the stacks studying medicine at Cumming School of Medicine. While still a student, he discovered that a bent-shaft shovel reduces mechanical loads on the lower back. In another study, he developed a method for predicting the type of footwear a person needs to reduce loading in the knee — plus, he formed a company, **GlacierRX**, with epidemiologist and medical student Isabelle Vallerand. The busy duo now uses their expertise to help industry, academia and governments develop and test new products, technologies and workflow systems.



Aubrey Blair-Pattison, MSc'15

Ammolite BioModels

Aubrey Blair-Pattison created a new bone-simulation material that feels, acts and responds like real bone for her master's thesis in biomedical engineering. Her company's orthopaedic model aims to cut the cost, time and risks of surgeries by improving orthopaedic training outside the operating room. Last year, **Ammolite BioModels** won \$100,000 in the first TENET I2C (Innovation to Commercialization) Competition and is using the seed money to finalize first product offerings and scale up product manufacturing.



Nancy Markley, BSc'89, MSc'95

MPowrx Health and Wellness Products

Nancy Markley launched **MPowrx** by selling and marketing an innovative anti-snoring and sleep apnea device invented by Calgary dentist and researcher, Dr. Leslie Dort. Most anti-snoring mouthpieces open the jaw with a hard plastic device and complicated mechanics that advance the lower jaw. But the Good Morning Snore Solution mouthpiece uses a simplified tongue stabilization strategy that moves the tongue forward to clear blocked airways. MPowrx's products are now sold in more than 85 countries and the company is currently working on a child version of the device. In 2016, Markley received the Startup Canada Woman Entrepreneur Award-Prairies Region. — MW



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Innovations-a-Go-Go



1. MEDi

a.k.a. "Medicine and Engineering Designing Intelligence" is a two-foot-tall robot that acts as a pain coach to comfort children during painful or intimidating dental or medical procedures. MEDi robots can speak 20 languages and are programmed with sets of behaviours that match the steps of a procedure. Let's say a child is about to be given an IV. Simply click IV "start" on the tablet which will deploy MEDi to walk, give high-fives and dance — anything to coach and encourage the child. MEDi inventor **Tanya Beran, PhD'02**, named her startup company **RxRobots** because she thought of the robot as a prescription for pain relief.

2. Doppio

is a dual-screened smart watch — a name inspired by a double espresso shot of coffee. The second screen aims to solve one of the challenges of interacting with a smart watch: its small screen size. Rotating the second screen allows the user to not only switch between apps, but the screen's different sides can show just parts of an application, such as an extended weather map or forecast. **Teddy Seyed, BSc'11, MSc'13** (now a third-year PhD student), is developing Doppio with collaborators from Waterloo University and Dartmouth College and is pitching the prototype to large companies in China.

3. FRED

stands for Field Ready Electrochemical Detector. This unique bio-sensor system uses bacteria that can be tuned — genetically modified — to detect trace amounts of different types of chemicals in water samples. The bacteria are contained in a consumable cartridge. Start by injecting a water sample into the cartridge at the site, then place it in the handheld detector. Next, press the start button and, one hour later, you'll receive (wirelessly) the data on your mobile device or computer. **FREDsense Technologies**, which was co-founded by CEO **David Lloyd, MSc'13**, will launch its first product, an arsenic testing unit, later in 2017.

4. Cups2Go

is an innovative, paper-thin cupholder design that's a boon to moviegoers and sports fans as it allows patrons to easily transport beverages. The spiffy unit is able to carry two cups and a consumer can easily handle multiple units, if needed. The Cups2Go holders also have a large marketing space for companies to display their names and logos. Founder **Daniel Schneider**, a business student whose **Cups2Go** idea won first prize in the Hunter Centre's RBC Fast Pitch Competition, was inspired to create the product because he thought the current drink trays were ugly, flimsy, awkward and, overall, a bad design. — MW

The Holy Grail for Our Energy Future

Around the world, renewable energy industries may account for only a sliver of energy consumption — but they're growing. And they're counting on places like the University of Calgary to help power that growth

One of the greatest challenges in the 21st century is the transition to a climate-neutral energy system — and UCalgary is uniquely positioned to lead that transformation. Our energy research strategy, *Energy Innovations for Today and Tomorrow*, is the framework through which the university plans to achieve lasting economic and environmental benefits for Canada. We caught up with **Ed McCauley, VP Research**, to ask how his office is supporting entrepreneurial thinking, innovation and creative disruption in the key areas of clean technology and renewable energy:

Why is UCalgary focusing on clean-tech and renewable energy? Everyone understands the challenge in supplying a growing population with energy extracted using a much smaller environmental footprint. The challenge is so huge that there is not one magical solution or panacea. But our diversified research approach is creating new ways to unlock hydrocarbon resources with zero carbon emissions, bolster new techniques for increasing the energy from renewable sources and design new energy-conversion approaches to capture the carbon that's already out there. Our partners from industry, government and other institutions have come together to create solutions that will affect real change.

What are the collaborative ways that are advancing entrepreneurial growth in these areas? One major vehicle that translates our discoveries into real-world solutions is the Global Research Initiative in Unconventional Hydrocarbon Resources. The project includes facilities and collaborations in China, Mexico, Israel and Canada, providing opportunities to test new ideas and apply new solutions at scales that will accelerate deployment and adoption by industries.

Our Canada First Excellence Research Fund program supports the Western Canadian node of that initiative, which includes partnerships that strengthen our entrepreneurial growth. We've teamed up with SAIT, which brings expertise in prototype design, optimization and scale-up as

researchers are looking to test and validate technology, and with Innovate Calgary to provide tech-transfer, intellectual-property and business-incubator services. These partnerships support our researchers as they bridge the gap between discovery and innovation.

How has the arrival of leading nanotechnology researcher Steven Bryant and the recent \$75-million Canada First Research Excellence Fund (CFREF) grant having an impact in advancing research and entrepreneurial innovations? This has given our research capacity a huge boost. Dr. Bryant brings a world-class suite of technological advances, and he's also a leader in mobilizing research capacity across campus, integrating fundamental science research and engineering to solve our grand challenges.

This boost means that we're making tremendous progress on solutions that will have long-term benefits for Canadians. We're working with a broad range of partners to bring new technologies to market, with the goal of moving toward a low-carbon future.

What are some examples of commercialization that UCalgary is pursuing in the areas of clean-tech and renewable energy? We've embedded commercialization into the research process within our CFREF program. We have a technological assessment team who evaluate the potential of early stage research to increase the chance we'll end up with a competitive solution, and an energy technology accelerator team to advance tech with commercial potential. We're also involved in a new initiative — the Kinetica innovation Centre (KICS) at SAIT, which is a facility and program that helps clean energy technology startups and researchers design, prototype and test their proprietary technologies.

— MWU

Vice-President (Research)
Ed McCauley, Office of the
Vice-President (Research)





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Alumnus Uses Entrepreneurial Thinking to Turn Profit in Depressed Industry

Beaver Drilling (Beaver) is the largest family-owned and operated drilling company in Canada, has rig utilization double the industry average, and continues to maintain profitability despite tough economic times. So how has Beaver achieved the seemingly unachievable? The answer is entrepreneurial thinking.

In 2015, Kevin Krausert, GEEMBA'13, and president at Beaver, enrolled in Haskayne Executive Education's Entrepreneurial Thinking program to investigate new options for Beaver. Krausert explains: "I was looking to shift my way of thinking in order to capture new value in the changing market."

Over the course of the two-day program, Krausert learned a new method of business thinking and subsequently developed a

"Entrepreneurial thinking is necessary to capture value in new and changing markets. Businesses cannot afford to ignore this new way of thinking."

plan to pivot Beaver towards a new future. To maintain Beaver's competitive edge, Krausert discovered how he could accelerate a new technology strategy for Beaver and also identified a new international project.

When asked what advice Krausert would give to other companies about entrepre-

neurial thinking, he responded, "We can't continue to use the same thinking of the past. What makes success today does not guarantee success tomorrow. Technology and innovation are rapidly changing the Canadian environment. In order to stay ahead, entrepreneurial thinking is necessary to capture value in new and changing markets. Businesses cannot afford to ignore this new way of thinking."

Haskayne Executive Education offers executive development programs for individuals that help to diversify their skills and advance their career. If you are interested in learning more about Executive Education's programs for individuals, organizations and board directors, visit haskayne.ucalgary.ca or call **403.220.6600**.



Beaver Drilling President Kevin Krausert, GEEMBA'13

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Dropping In

TAYLOR INSTITUTE FOR
TEACHING AND LEARNING

Global Challenges

by Deb Cummings

Like the course name, Global Challenges, suggests, this class begins with a big and messy problem: How will we feed 9 billion people? It's a question an eclectic group of 22 first-year students is attempting to answer in this inquiry-based course — the first to be taught at the College of Discovery, Creativity, and Innovation (CDCI) in the new Taylor Institute's arm for interdisciplinary learning experiences and undergraduate research.

Pop into this learner-driven environment and you're likely to find a professor, perhaps a guest speaker, in one of the five studios, but gone is the traditional "sage on stage" setup. Instead, the facilitators might start the class with a *PowerPoint* presentation loaded with, say, images of farms around the world. If it's guest speaker-farmer Brenda Schoepp's turn, you might just see personal shots of her wielding a machete in Cuba, explaining that country's "chop-and-drop" system of farming, or standing next to a bony (but "dual-purpose") cow in India. She peppers her presentation with provocative statistics — it takes 10 days to starve a city in North America; most farms are 1.3 to 3 acres in size (in Canada, however, the average is 495 acres); it will cost \$53 trillion to develop a global infrastructure to fix our broken food-distribution systems. Students, afterward, swivel around in little clusters to discuss the challenge.

Some presentations focus on the connection between gender equity and global food challenges, while other groups debate climate-change issues and how to tax food waste. Twenty minutes later, the students roll their chairs into a circle, wirelessly connect laptops to 50-inch touch screens and share their findings with each other. Questions and interests guide the inquiry process, which is open-ended and tends to generate lively discussions that veer in various directions.

"In designing the content for Global Challenges, we were looking for a problem or a theme that is a major issue of concern to society," explains CDCI director Jay Cross. "One that would require interdisciplinary collaboration in order to make the world a better place, and also one that captures the imagination of undergrad students who are looking to develop new ideas and want to be actively involved in their own learning."

OUTSIDE TI's STUDIOS

Auto-Sensing Controls

Placed on the ceiling are sensors that read the number of occupants in the room and automatically adjust the lights and HVAC system to accommodate.

Tinkling the Ivories

Tucked in the corner of the TI's tiny gallery is this elegant Kingsburg grand piano that can be played by anyone, from 8:30 a.m. to 5 p.m., Mon.-Fri.



1

2





Photos: Marnie Burkhart

What was first dubbed a “teaching podium” has become a “teaching lectern,” and collaborative carts have morphed into pods. So new is the Taylor Institute for Learning (TI) that terms and language, like the space’s usage, are still evolving. One constant, however, is that these classrooms (er, “studios”) are likely nothing like you’ve seen before. Take a peek:

1 Wheels In any of TI’s five single learning studios, you’ll spot scores of wheels — about 335 per studio, on every table, chair, screen, whiteboard and collab-cart.

2 Collaboration Carts/Pods Each of the 37 mobile carts include a 50-inch, touch-enabled LCD screen, a webcam, microphone, speaker for video conferencing and pre-installed apps.

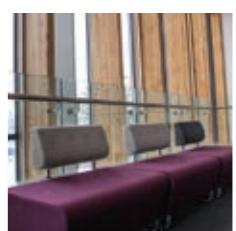
3 Teaching Lectern Think of this stand-up desk as Mission Control for pros. What’s found on this “table” gives them access to a drop-down 10-ft. screen, as well as to individual screens on the mobile carts and in the breakout areas. Tap the Active Living icon on the touch panel and you control the blinds, lighting and audio. A selection of wireless mics also live on this table, as does a document camera and a wireless mouse that doubles as a clicker.

4 Projector This powerful laser projector means no bulbs, no heat, a longer lifespan and instant-on capability.

5 Skyfold Walls The five studios can easily become two by adjusting these slick, pantograph-style walls. We timed the transformation: 1 min. 36 sec. for a 14-ft. wall to zip up. **U**

Touch screens

Located in and out of studios, dozens of touch screens enable students to stay linked to each other and the project under study.



Reflection Loft

With floor-to-ceiling windows, you’ll find comfy, European-designed couches and USB power/charging ports in this little sanctuary on the second floor.



Hanging Study Pods

Suspended over the TI’s main atrium, these four pods are the most popular feature in the TI and are always filled with students.



Unconventional Paths

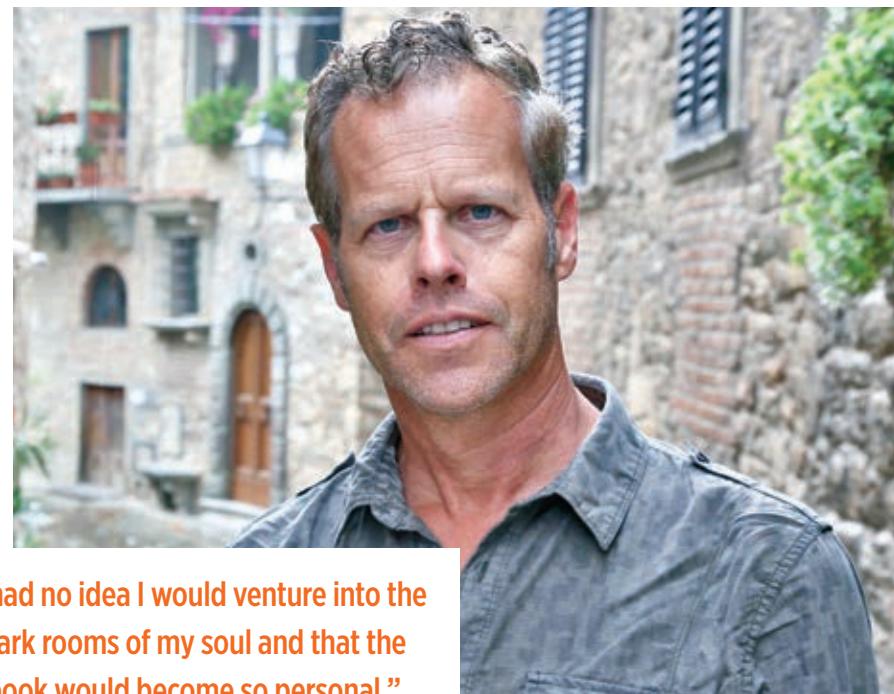
Glenn Dixon

BEd'82, MEd'96

High school teacher for 20 years, itinerant traveller and author of three books, Glenn Dixon reflects on Verona, his disastrous love life and Fyodor Dostoyevsky. Aiming to right his past failings — he so wanted to be a rock star and a writer — Dixon now plays in The Barrel Dogs and has just penned *Juliet's Answer: One Man's Search for Love and the Elusive Cure for Heartbreak*.

What did you want to do at 18? I wanted to be a rock star. So I moved to Toronto and joined a band. But I remember opening the fridge one day to see one lonely apple and I had only \$10 to my name, and saying, "This is not a good idea." So I came back to Calgary. **How did you become an ESL teacher?** I always wanted to create and so, when I failed at being a rock star, I decided I wanted to be an art teacher. However, the jobs were in ESL, which I wound up loving enough to take my master's in linguistics, which I also loved. **What else did you do while you were a student?** When I was an undergrad, I was on the swim team. **When you were a teenager, what were your favourite books?** *The Brothers Karamazov* and *Zen and the Art of Motorcycle Maintenance*. **Who are your literary heroes today?** David Mitchell (loved *Cloud Atlas*) and Alice Munro (for her sentence structure). **How many times have you taught Romeo and Juliet?**

20. **What is your favourite play of Shakespeare's?** *Hamlet*. **How many letters did you write while volunteering in Verona at the Club di Giulietta (House of Juliet)?** I ended up going back three times, so, maybe 200. **How many letters does the club receive a year?** About 10,000, and each one is replied to, and signed "Juliet." **Were any of the letters difficult to write?** Yes, we received one from a 21- or 22-year-old woman who had cystic fibrosis. Her boyfriend wanted to marry her, but she wasn't sure. "We know how this is going to end," she wrote in her letter. **What was your reply?** I consulted with the other secretaries and we jointly decided to suggest she say yes. We saw ourselves as a sympathetic ear, not a problem-solver. **What were some of the biggest lessons you learned while writing letters?** You should love yourself



"I had no idea I would venture into the dark rooms of my soul and that the book would become so personal."

first and others will follow. And one of the secretaries told me that every time you answer a letter, you are answering yourself. I believe that. **How did you structure this book?** This one was a great unwieldy thing because my agent decided she wanted something different from what I had pitched. So, halfway through the writing of this book, it began writing me. I had no idea I would venture into the dark rooms of my soul and that the book would become so personal. **Sticking with the theme of romance, what is one of your favourite love songs?** *Here, There and Everywhere* by the Beatles. **Any guilty pleasures?** Red wine... just another reason to love Verona, which is surrounded by the hills of Valpolicella. And any kind of pasta. **Of the 75 countries you've travelled to, where does Italy fall?** There are a handful that I would go back to

time and time again — Italy is one of those. **Any travel tips?** Go in the off-season. But, if you do go in the summer, get off the main tourist trek and visit Verona where you will find opera being performed in a Roman coliseum that seats 20,000 people. **Do you have a motto you live by?** A line by Romeo that fits in with the theme of the book: "I defy you, stars!" **What other research is included in this book?** I applied for special permission to see the second quarto of *Romeo and Juliet* that is housed at the British Museum. To be taken into a vault and be given the original play (under 100 pages) that fit in the palm of my hand was the most extraordinary thing. **Any advice for new students?** If you don't know what you want to do, start off in general studies. You will find professors along the way who will help you focus. — Deb Cummings

Dr. Jim Strong

BSc'88, BSc'90, PhD'96, MD'97

How does a microbiologist, educated at the University of Calgary, wind up living in Winnipeg where he toils over the effects that nasty viruses have on humans? We caught up with this four-time alumnus who has worked in some of the planet's deadliest zones, such as Sierra Leone and Guinea, where the explosive 2014-15 Ebola epidemic took 11,000 lives. We peered in his suitcase: A Leatherman multi-tool, waterproof matches, fishing line, chlorine tablets . . . oh, yeah, and dental floss. We had questions:

Is your area of research exciting? Quite, especially during an outbreak. But, like any job, about 95 per cent of the time it's the same thing over and over again (meetings, emails, grant- and paper-writing) and five per cent is the "cool," other stuff. **What advice do you have for students interested in your field of research?** Go for it! It's a great job, but remember — there is only one Level 4 containment lab in Canada (capable of handling viruses such as Ebola) and only a handful throughout the world. **At 18, what would you have said you'd be doing at 45?** Surveyor — maybe? My dad was a surveyor for oil exploration and I used to work with him back then. I loved being outdoors all the time, often in the

middle of nowhere. **Why work in Africa?** I've been deployed to four different outbreaks: Uige, Angola, 2005; Luebo, DRC, 2009; Isiro, DRC, 2012; Guinea and Sierra Leone, 2014-2015. In each outbreak, we worked for four to six weeks at a time. **When you're in the field, what does a typical day look like?** Get up at 6, eat breakfast with the MSF (Medecins Sans Frontieres) and/or WHO (World Health Organization) staff. Travel to the lab by 7:30 and bleach the mini-lab, gas up the generator and then get the machines and computers running. We'd start receiving samples by 9 a.m. and would usually run a morning set of tests and then another later in afternoon. We'd head back to hotel/lodge house for dinner

at 8 p.m. and cap off the evening with a "coolish" beer and be in bed by 11. **What were the working conditions?** It was always hot, sometimes raining like I have never seen before! We always wore surgical scrubs and gum boots at

the Ebola Treatment Centre, just like the MSF staff. When samples from the patients were available, the MSF staff would yell "Lab, lab, lab," and we would walk over to the exit area, where the health-care teams would be sprayed with bleach, in order to retrieve the samples in a bucket that the hygiene teams would spray again with bleach (each blood sample was packaged in triple Ziploc bags sprayed with bleach, with patient identifiers on a separate sheet or on the tube). We never saw any hostility and the locals were always very good to us and friendly. **Is there a certain "thing" you hope to discover in your lifetime?** Yes, I would love to answer the question of where does Ebola hide between outbreaks.

There is a big piece of that puzzle that is still missing, despite intensive research. **When you are living/working in pretty basic conditions, what do you miss about home?** My wife and daughter first. And my dog. Beyond that, maybe barbecuing and air-conditioning, but our lodging during the more recent outbreaks has been more comfortable than the earlier ones, so I can't really complain. **What is your idea of happiness?** Family, friends and ongoing health. Oh, yeah, and a lake full of fish and a boat helps, too. **What kind of books do you read?** Historical fiction. **What are your three favourite movies?** Good Will Hunting, Stand By Me, Lion. **Who are your heroes?** Astronauts and space scientists were my heroes as a kid. I am not sure that I have heroes now. I think my dad qualifies — I lost him last year and miss him a ton. **What do you miss about Calgary?** Meatball sandwiches from Spolumbo's and the mountains. If there were mountains in Manitoba, I would consider this the perfect place. — Deb Cummings **U**



"When samples from the patients were available, the MSF staff would yell 'Lab, lab, lab...'"



The Truth Matters, Now More Than Ever

by Susanne Craig

Our alumni are doing big things all over the world, and Susanne Craig, BA'91, is a great example. If her face looks familiar, it's because last fall she broke a bombshell story about Donald Trump's tax returns and, overnight, became an unwilling American TV celebrity.

What you may not know is that Craig is a UCalgary political science alumna who, long before she began working at the *New York Times*, got her start at the *Gauntlet*.

We like to support open dialogue from a diverse range of opinions and perspectives, and in that spirit here is her story . . .



In early 2016, I found myself with a job few people would have predicted had a long shelf life: Covering Donald Trump's bid for the White House at the *New York Times*.

I was sitting at my desk in the paper's City Hall bureau in late January when the phone call that changed the course of my career arrived. "I've got a great assignment for you," declared Wendell Jamieson, my boss and the paper's Metro editor. "It should only take a few weeks."

Let's just say it didn't quite work out the way he predicted.

A bit of background: I spent years covering finance, first at the *Globe and Mail*, then the *Wall Street Journal*, followed by the *Times*, and it was this experience that made me an ideal candidate for the story Mr. Jamieson had in mind. He wanted a colleague and me to take a close look at Mr. Trump in New York City, and drill down into what local real estate he owns, and what doesn't he own. In Manhattan, this was a particular riddle because Mr. Trump's name, through marketing agreements, is on a lot of buildings he doesn't actually own. When the call from Mr. Jamieson landed, Mr. Trump was one of several candidates in a crowded field looking to clinch the Republican nomination. The first primary, in Iowa, was just weeks away.

I never did return to City Hall. Donald Trump kept winning and I kept reporting on him. I wrote about his aging fleet of air-

craft. Last April, I discovered the registration on Mr. Trump's Cessna had expired. I called the Federal Aviation Administration, and that agency grounded the aircraft. I wrote about the Trump Organization. In the spring of 2016, the *Times* hired a title search firm to examine all of Mr. Trump's properties. A three-month-long project revealed significant business entanglements beyond what Mr. Trump had disclosed publicly as part of his bid for the White House, including almost US\$2 billion in partnership debt to financial institutions such as the Bank of China and Goldman Sachs.

Then, one Friday afternoon, I went to my mailbox at the *Times* and found three pages of Mr. Trump's 1995 tax returns, the journalism equivalent of a winning lottery ticket. Over the next week, my colleagues and I worked 'round the clock to decipher what we had, and to confirm the authenticity of the documents. We ultimately did, and, through those three pages, we were able to show that Mr. Trump likely had not paid income tax in decades, something he confirmed in the wake of our story during a presidential debate.

Throughout 2016, I would joke that Donald Trump was the greatest thing to happen to journalism in years. He made for great copy, and readers couldn't seem to get enough. It's just too bad it's not that simple. Mr. Trump is good for journalism in that perverse way that war is good for the economy. The very public and dangerous campaign he is waging against the

media is a real threat to a free press. I am a believer in the adage that democracy is the worst form of government, except maybe for all others. The media is about as perfect as democracy, but a democracy cannot thrive, or even really work, without a strong fourth estate.

Mr. Trump banned certain news organizations from his rallies, including the *Washington Post*, during this presidential bid. He has threatened to sue reporters and their employers — including mine — for stories I have written. He has made blatantly false statements about news organizations, including a recent claim that the *Times'* subscribers and readership are falling (they are not). At rallies and on Twitter, he has singled out individual reporters, making them targets for public abuse. He has called solid, but negative reporting "fake news." In late January 2017, Stephen K. Bannon, a senior advisor to Mr. Trump, repeatedly referred to the media as "the opposition party" in an interview with my colleague, Michael Grynbaum.

Last year, toward the end of a particularly testy series of phone conversations I had with Mr. Trump about a story he was not happy I was writing, he made light of his media-bashing. "You will write bad, and I will tweet badly about the *Times*: that they are inaccurate and don't know what they are doing," he told me. "And that is what we do. We play the game."

For Mr. Trump, it's a potentially smart



Illustration by Kelly Sutherland

game — at least in the short term. If he can make people believe the media is untrustworthy, they may be more likely to turn to him for information. Then, when credible, but critical stories about him are published, he has already sown those important seeds of doubt: Don't believe what you read, folks. The media is out to get Donald Trump. At least, according to Donald Trump.

The news industry was ripe for Mr. Trump's war on words. Newsrooms continue to struggle as print circulation and advertising dollars fall, while digital revenue is not backfilling the hole. The *Calgary Herald*, where I got my start in daily journalism, has all but merged with the *Calgary Sun*. This means fewer people are covering the mayor, the premier and everyone in-between. No one wins, except maybe politicians who are happy to have fewer eyes looking at them.

These days, many people don't even know where their news is coming from. The Internet has redefined what the word "media" means, and it's often applied equally to reporters at publications like the *New York Times* and anonymous bloggers. And, as consumers have become less

discerning, fake news and false stories — parading as real news — have exploded. Mr. Trump has even used this phenomenon to further undermine public confidence in the media.

"You are fake news," Mr. Trump said at a news conference in January 2017, berating CNN reporter Jim Acosta, whose employer had reported not fake news but, rather, had accurately reported about the existence of an unsubstantiated research dossier that included unflattering information about Mr. Trump.

The somewhat unexpected silver lining in all this is the "Trump bump;" the president and his attacks on the media have provided amazing advertising for the value of original, shoe-leather reporting. Online newspaper subscriptions are on the rise. The *New York Times* added 276,000 net new digital subscribers in the fourth quarter of 2016, the best single quarter since 2011 when the *Times* launched its online pay model, and more net new subscriptions than in all of 2013 and 2014, combined.

News organizations across the country have committed additional resources to covering Mr. Trump, his administration and his family. In January, the *Times* an-

nounced that an additional US\$5 million had been earmarked to cover the Trump administration. "Covering this story aggressively, fairly and unrelentingly will be the top priority for the *New York Times* newsroom this year," *Times* executive editor Dean Baquet and Joe Kahn, managing editor, wrote in a recent note to employees.

In an article titled "Trump Is Making Journalism Great Again," *Politico* called Donald Trump the best thing to happen to our industry since the invention of the expense account. These days, Washington is overflowing with stories. The conflicts that flow from Mr. Trump's decision not to sell his assets alone have been a full-employment act for an army of reporters, myself included.

In attacking the media, Donald Trump is playing to his audience. In doing so, he has clarified for reporters who their audience is — readers who expect reporters to be a watchdog to those in power. We shouldn't play his game. We shouldn't play anyone's game. Our best response is to do our jobs, and report without fear or favour. And we need to be fair and balanced, even if the subject we are covering is sometimes neither. **U**

Seven Healthy Habits Through the Ages

by Mike Fisher

If you were to grab a coffee during your first day of exploring UCalgary's main campus as an undergrad, peer into it and, instead of seeing a barista-styled leaf, you could glimpse the future — here is what you'd see. A path ahead that runs through all of the coming decades, ribbed with a silver lining.

Recognizing that each decade poses distinct challenges, we've asked experts to reveal the healthy habits that can help you navigate your 20s, 30s, 40s, 50s, 60s, 70s and 80s more easily.

Take a look at where you stand and consider the wisdom of the researchers, alumni and thought leaders who've provided their distinct perspectives on how to move ahead gracefully — and healthily. Explore and live large with this handy guide to your well-being.

20s

Healthy Habit for Your 20s: Mix it Up

Ah, the youthful days. Now is the time to mix it up with a variety of activities.

- ✓ Canadian Physical Activity Guidelines recommend 30 minutes of cardiovascular exercise daily, as well as incorporating resistance training at least twice a week. Do so and you're boosting your heart health, so important throughout your life, as well as your muscle strength.
- ✓ There will be days you'll want to be outside, in the fresh air, around trees, water and hills. Do it. You'll feel better mentally when you connect with nature.
- ✓ Spend more time with others, too. Maybe bring your friend or your friend's dog along for a walk and a talk. You'll feel both calm and energized.



— **Patricia Doyle-Baker**, assoc. prof. in kinesiology, whose research involves preventative medicine, clinical exercise physiology and epidemiology.

30s

Healthy Habit for Your 30s: Plan for Prosperity

Your 30s will likely be one of the most financially demanding decades of your life.

With Canadian household debt ratios hitting record highs, it is particularly important for young income earners to take control of their finances and implement smart financial habits.

Here's how:

- ✓ Prepare a plan that outlines your financial goals, and set a budget that will track how much money you'll have coming in and going out. Doing so will help prioritize your spending and manage your money.
- ✓ Spend less than you earn.
- ✓ Pay down debt. Make it one of your top priorities. Pay down your most expensive debt first.
- ✓ Develop the habit of saving. Set up an automatic transfer of 10 per cent of your income into a separate savings account.
- ✓ Make the most of tax-advantaged accounts such as TFSAs, RESPs and RRSPs.







"Pay down debt. Make it one of your top priorities. Pay down your most expensive debt first."

✓ Focus on accumulating diversified assets including stocks, bonds and real estate over the longer term.

✓ Remember, it is never too early to start preparing for your retirement.

– **Sarine Mustapha**, BComm'00, senior vice president and associate portfolio manager with BMO Nesbitt Burns. She serves on the Dean's Management Advisory Council at the Haskayne School of Business.

40s

Healthy Habit for Your 40s: Ease Stress with Yoga

The 40s can be consistently stressful as people work to advance their careers while often juggling the demands of a young family.

✓ When you're in a constant state of stress, your sympathetic nervous system sends messages to the adrenal glands to pour out cortisol, which can lead to exhaustion.

✓ Engage in preventative measures. Yoga embraces the science of healing and balances the nervous system. The physical aspect of yoga prepares your body to be in meditation, quieting your busy mind and promoting well-being.



✓ If you are new to yoga, restorative yoga or yin yoga are gentler ways to begin your yoga practice.

– **Carol Hutchison**, orthopaedic surgeon and yoga teacher-trainer at Yoga Passage

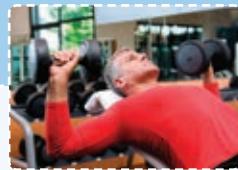
50s

Healthy Habit for Your 50s: Maintain Bone Health

Bone health declines with age, as the risk of osteoporosis and fragility fracture increases. At least one in three women and one in five men will suffer from an osteoporotic fracture during their lifetime.

- Bone loss begins in your 50s, and for women it may accelerate around the time of menopause.
- To help maintain bone health, you should consume 1,200 mg of calcium daily, ensure you receive adequate vitamin D (600-4,000 IU/day) and exercise to build muscle strength and prevent falls.
- Activities that load the skeleton (walking, running, weight training) are excellent for skeletal health.

— **Steven Boyd**, UCalgary professor and director at the McCaig Institute for Bone and Joint Health;
Lauren Burt is a postdoctoral fellow at the institute.



60s

"Try something new, such as learn a new language or how to play a new musical instrument."

Healthy Habit for Your 60s: Train the Brain

Work tips for healthy brain aging into your daily routine.

Here's how:

- Keep your body in shape with regular aerobic exercise, which can promote healthy blood flow to the brain and keep your mind sharp.
- Activate your brain by reading and doing puzzles.
- Try something new, such as learn a new language or how to play a new musical instrument. Develop a hobby such as photography.
- Maintain brain vitality by being socially engaged.
- Watch your weight and stick to a heart-healthy diet that avoids bad fats and cholesterol.
- Seek treatment for depression and sleep apnea.
- Discuss with your doctor how to manage risk factors for stroke or heart attacks, including high blood pressure, diabetes and high cholesterol.

— **Marc Poulin**, professor in the Cumming School of Medicine and Faculty of Kinesiology, and member of the Hotchkiss Brain Institute and the Libin Cardiovascular Institute of Alberta.

70s

Healthy Habit for Your 70s: Fight Fatigue

Fatigue can affect people at any age, but for different reasons. Factors can include stress, disease, excessive workload and poor sleep.

- Aging can bring a double whammy. On the one hand, aging can make it harder to fight fatigue when doing physical activity, particularly dynamic and intense exercises. On the other hand, the prevalence of sleep disorders increases.
- Prolonged, low-intensity exercise in the late afternoon actually improves sleep quality and quantity.
- Naps, particularly long naps, are not recommended, since they can affect sleep the following night.
- People experiencing fatigue must progressively increase the amount of daily physical activity. In addition to the beneficial effects on sleep, regular exercise improves fitness levels, reduces anxiety and, overall, decreases one's feeling of fatigue.



— **Guillaume Millet**, professor in the Faculty of Kinesiology, whose research includes studying fatigue in athletic and clinical populations.

80s

Healthy Habit for Your 80s: Get Motivated

You can be physically active well into your 80s, even though you might find it hard just to get up and get going.

- At this stage of life, many people have faced losses and life-altering challenges such as cancer and other illnesses.
- Whether you're building upon fitness and wellness practices from your 60s and 70s, or starting anew, motivation is a key consideration.
- Think about your motivation for being active. Is it to maintain independence? Is it to maintain a positive outlook? To stay social and remain engaged with your family and friends?

You can make gains in all of these areas.

- Move every day.
- Choose an activity that you find pleasant and that engages you with others.
- Remember, social support is critical for maintaining an active lifestyle.

— **Nicole Culos-Reed**, professor in the Faculty of Kinesiology, whose research focuses on quality of life and physical activity for cancer survivors. 



Alumni Update

As the University of Calgary's 50th anniversary celebrations conclude, it's a good time to share how the university is responding to what matters to us in our relationship with our alma mater.

Here are highlights from last year's survey of alumni:

- 80% of us are interested in what is happening at the university and in our home faculties;
- 73% are interested in attending university events with an intellectual, educational or cultural focus;
- 50% +/- are interested in career-related programs and activities; and
- 50% +/- want to maintain a lifelong relationship with the university.

These statistics have refined and reenergized the university's alumni relations effort with new programming, increased opportunities for engagement and improved communication content and tools.

New career-related programs include monthly virtual and in-person career coaching,

as well as bimonthly webinars covering topics like resume writing and interview preparation. In the coming months, alumni will be invited to participate in our UCalgary Stampede event, the Calgary Pride Parade and Alumni Weekend 2017. Program content and access to many other university events will continue to evolve in response to alumni feedback.

For alumni wanting to participate in university life beyond attending events and programs, there is an increasing number of opportunities for alumni to volunteer as workers, hosts, speakers, mentors and in leadership roles. Alumni are also encouraged to help shape UCalgary's legacy by shining a light on alumni accomplishments, such as by nominating a worthy colleague for an Arch Award (deadline for 2017 nominations is May 10), or by letting us know about a colleague's success so that we can recognize and share it with the university community and beyond.

To keep you up to date on what's going on at the university, alumni now receive two email newsletters each month. *Alumni News* (second



Tuesday) focuses on university matters of general interest and interesting stories about alumni. *Alumni Connection* (fourth Tuesday) highlights events, programs and activities that we are invited to attend. It's also easier than ever to stay connected through Twitter, Facebook, Instagram or LinkedIn.

For more information on programs, volunteer opportunities, sharing colleagues' successes or to sign up for your favourite communication channel, please go to ucalgary.ca/alumni.

Vern Kimball

President, UCalgary Alumni Association

UCalgary Giving Day

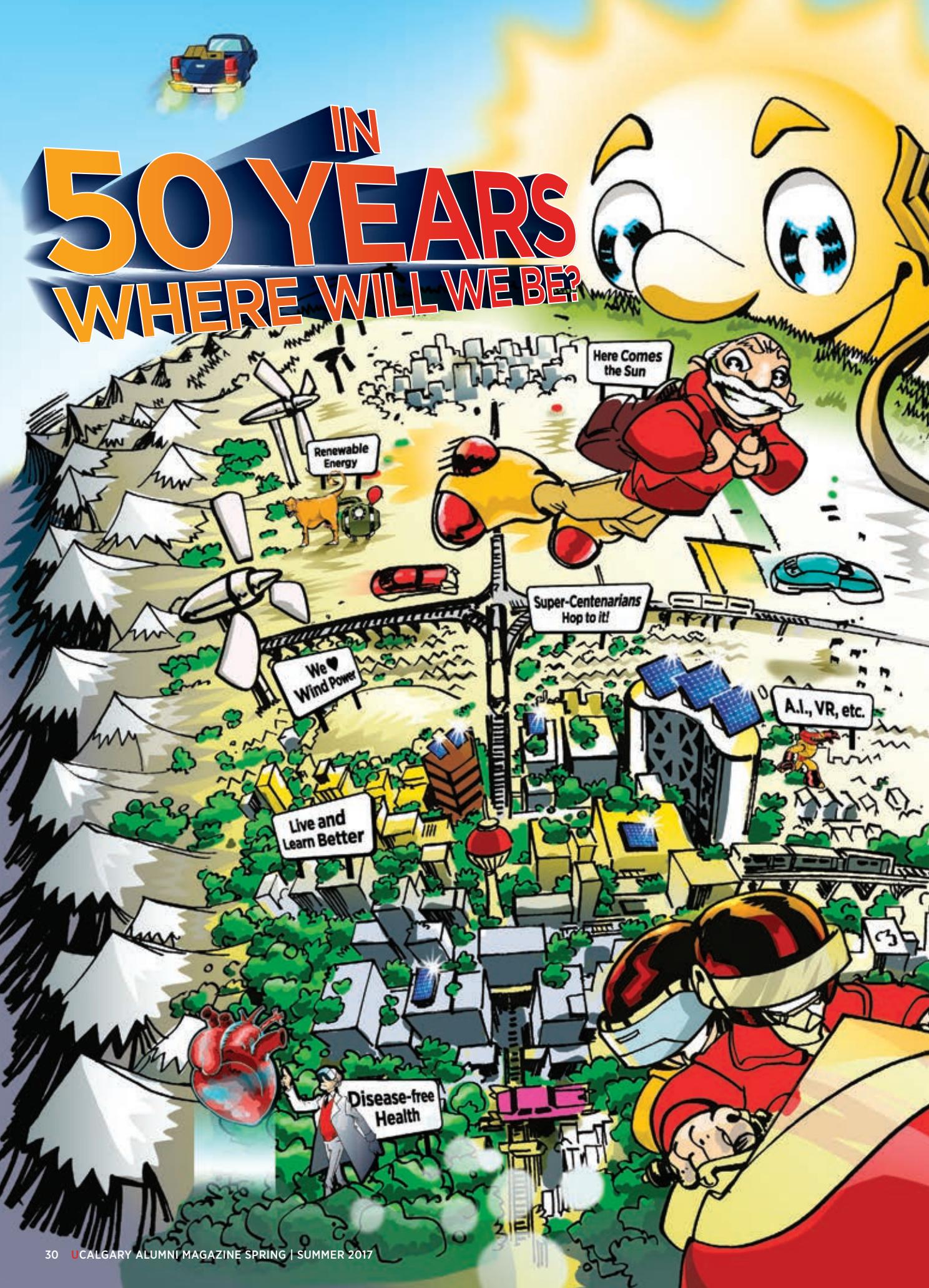
50 hours 50 scholarships 50 years of impact

starting
4.27.17

Spark change in your world... support a student!

#UCalgaryGivingDay
ucalgary.ca/givingday

IN 50 YEARS WHERE WILL WE BE?





For those of us still kicking around in 50 years (thanks to trippy medical innovations, your chances of that may be better than you think), life is going to be a little different. From factory-built homes to autonomous cars, UCalgary's take on our future is bright, bizarre and, in most ways, better. Hold on tight

Stories by Val Berenyi and Jacquie Moore

Illustrations by Travis Sengaus



Despite its short, 24-episode run and goofy premise, the original version of *The Jetsons* managed to both animate and stoke the circa-1960s imagination in terms of what a North American city might be like 100 years hence. Flying cars, space tourism and dozens of other eccentric inventions seemed both prescient and possible. While iterations of some of the cartoon's gizmos and predictions have, indeed, materialized some 50 years later (flat-screen TVs, crippling pollution, dog treadmills), the next half-century promises a deluge of even more incredible, once implausible, developments. In 50 years, the so-called third industrial revolution will likely alter how we work, eat, age, build, socialize, travel and steward this (if not another) planet.

The advancements of the early to mid-20th century are often heralded as the most crucial life-enhancing breakthroughs since the invention of the wheel. Indeed, it's been said that last century saw more progress than all the other centuries combined — we're certainly not going to argue with electricity, penicillin and the internal combustion engine. The second half of last century was no slouch, either (the pacemaker, civil rights movement, trips to the moon, the Internet) in terms of expanding human intellect, extending life, transporting people and goods and keeping us more connected.

So, what more do we want? Where are we headed as a human race? And how will we answer (and are we willing to ask) complex ethical questions around the rise of driverless cars, ingestible drones and an unprecedented abundance of super-centenarians? Indeed, where George Jetson's most vexing problem was a chronic sore finger from pushing buttons all day, 21st-century humans face enormous challenges as the confluence of advancements in biomedical engineering, robotics, quantum computers, epigenetics, big data and miniaturization radically transform life as we know it. What will life in Calgary, and the rest of the world, be like in the year 2067, and how will we — this city, this university — both lead and respond?

Matt Stambaugh, BA'02, is keen to answer all such persistent future-forward questions. A bona fide robot-geek, Stambaugh is working on a master's degree in geographic information systems and is VP for a robotics and remote-sensing startup. (If his name sounds familiar, it's likely because he's the former science and tech columnist for CBC Radio's *The Eyeopener*.) Stambaugh's take on 2067 is a mix of thrilling possibility and cautious concern.

"My hope is that UCalgary will play a significant part in answering the big energy question," says Stambaugh. "The way the world sources, stores and uses energy hasn't changed much in 100 years. Calgary is an energy hub — we could play a big role in enabling the next wave of technology in the energy revolution."

He also points to the Cumming School of Medicine's potential to lead in the field of robotic surgery. "We're already starting to hand off some pretty fundamental tasks to robots," says Stambaugh, adding he hopes that, in 50 years, robots will have replaced dull, dirty and dangerous jobs such as search-and-rescue operations and natural resource management. "Drones will be the eyes and ears, (the) key to the next revolution of massive amounts of big data." Stambaugh also imagines that tiny robots will soon routinely cruise around our bodies, solving problems at the cellular level. "Certainly, the lines will be more blurred between human and computer."

That intersection, he says, will call for a high level of academic leadership. "A university can offer a humanist perspective," says Stambaugh, who credits his political science education with enlightening his passion for technology. "We'll need clear answers on questions such as, 'What happens when a robot messes up?' and, 'How do we treat machines that can think?'

Already, Stambaugh says, technology is miles ahead of our legal and our social systems. But, he adds, "a university can take a step back and not just focus on technology — we can combine different perspectives on the impacts that will occur." UCalgary, he believes, "is ready to push that conversation forward." — JM



The Golden Age of Aging



First, the bad news: we are never going to live forever. The good news? We are never going to live forever. That sums up the measured perspective of Dr. David Hogan, the Brenda Strafford Foundation Chair in Geriatric Medicine at UCalgary. Indeed, with Canada facing a dramatic shift in demographics that will, by 2036, see an unprecedented one in four Canadians clock in at 65 years of age, our collective obsession with extending lifespan may be, as Hogan puts it, "a little misguided." It's quality of life, he says, not quantity of years, that matters more than ever.

"Humans are living longer than ever, but we're more scared of dying. Four hundred years ago, people were very religious, so death wasn't such a big issue. Now? We're very attached to life on Earth." — **Dr. David Hogan**

While advancements in disease prevention will no doubt make super-centenarianism (living to 110 or more) a regular thing in the future, Hogan believes that, for old age to be a truly appealing prospect, our society needs to make major changes in how the senior set are integrated into neighbourhoods, educational institutions and the workforce.

"We need to modify our social construct of life," says Hogan, who adds that living as long as Yoda doesn't much appeal to him ("We're not designed to live 500 years — it wouldn't be equitable with certain people having hundreds of years to gain money and power"). In any case, he says, the inevitable change in demographic, "is a game-changer that will influence everything." To put it bluntly: in 2067, oldsters are going to have clout. By then, Hogan hopes and expects, "we'll be a little wiser about what we focus on as we age." — **JM**

Retirement

You quit your job at 55 — now what? You might have 50 more years of life to live. "You can't just shuffle people off who are active participants in the work force," says Hogan. "We'll need to start using the talents of older people. I don't think retirement will be so abrupt. There will be more part-time work, more partial retirement options for people who aren't ready to just put their feet up."

Commerce

"We'll need more entrepreneurs developing products and technology for older people — to think not only about the business opportunities that may be out there, but also how they sell stuff that is geared to older people," says Hogan. "That crowd will have money to spend."

Education

"Right now, the process in our society is to go to school when you're young to prepare for your career," Hogan says. "That will change: education might be drawn out throughout one's lifetime, just as careers will be modified to allow for people to carry on longer."

Senior Suites of the Future

Apply "prefabrication" and "modular" to seniors' housing and you get UCalgary's Age-in-Place Laneway Housing project that will allow the elderly to stay close to friends and family — and out of long-term and acute care. Imagine a little 13-by-35-foot portable house that can be temporarily leased and popped into an urban or rural backyard. Inside, modular cabinetry and shelves are placed to suit the individual. Pictures adorn the cabinet fronts (bowls, cereal, etc.) as memory aids. A large-screen TV functions as an interface device for a medical healthcare team, with sensors for monitoring gait, hydration, unsteadiness and falls built right into the floor. Medical devices, say an IV pump, may be brought in as needed.

"The goal is to provide beautiful housing that empowers people and makes you feel good about living there," says professor and architect John Brown, who is leading the project. This futurist housing form is almost here — one unit will be piloted for three months this spring. — **JM**

The Death of Disease

Could getting sick become a thing of the past?

When former U.S. Vice-President Joe Biden announced that Project Cancer Moonshot's goal was to "eliminate cancer as we know it," he lit a spark of hope around the world — and churned up an ocean of controversy.

"A lot of people reacted negatively to that, saying it's just not possible," says Dr. John Meddings, dean of UCalgary's Cumming School of Medicine. "But in 50 years? I'm not sure that what he said won't be true." Indeed, as Meddings puts it, "the future of medicine is health — that is, the absence of disease. By 2067, we'll be closer to that goal."

Certainly, if anything's going to get us there, it's the advent of precision medicine.

Replacing the previous decades' focus on "evidence-based medicine," which was marked by the randomized controlled clinical trial, precision medicine treats individuals. "It's about precisely understanding the diagnoses of an individual and why they have that disease," says Meddings. "Why is breast cancer aggressive in one person and not another? What is it about an individual's genes, their environment, their diet, their stress level — what has gone wrong that has been expressed as a disease?"

The upshot of precision medicine is the ability — thanks to our increasing capacity to harness big data for DNA analysis — to match the therapy to the specific cause of an individual's disease. One big dream for medicine, says Meddings, is that someday we'll visit our family doctors not because we're ill, but to learn about our inherent susceptibility to certain diseases. "Your doctor would look at your genomic profile and environmental exposures reflected in your epigenome, as well as at other factors in your microbiome (see below), all of which could lead to disease." You might find out, for instance, that you shouldn't live so close to Highway 1 because you're genetically susceptible to asthma.

Related to that aspiration is the hope — expectation, even — that many diseases will be eliminated in 50 years. "Research has helped us understand smallpox and polio, as well as childhood leukemia, which has basically been cured with drugs," says Meddings. "In another 50 years, we could potentially eliminate inflammation-related diseases such as arthritis, depression, Crohn's, schizophrenia."

Overall, Meddings would like a future that sees our health care system turned on its head. "The most expensive system is one that treats disease, and the least expensive is the one that prevents disease and maintains health," he says. — JM

At Home on the Biome

Microbiome — science's coolest new kid — refers to the trillions of bacteria, fungi and viruses living in our bodies. These bacterial cells outnumber our own human cells 10 to 1 and, as it turns out, are key to understanding a host of infectious, inflammatory and chronic diseases; microbiome research is a huge part of future precision-medicine initiatives. In a gutsy move (terrible pun intended), UCalgary is leading the pack: the Cumming School of Medicine has just opened the Western Canadian Microbiome Centre, dedicated to exploring how microbiota research could unlock disease. — JM



True Detectives

The word "cure" is rarely associated with cancer when it's discovered in its often-unpredictable later stages. The key, of course, is to detect cancer long before it becomes a problem.

Dr. Greg Cairncross is director of the Charbonneau Cancer Institute at the Cumming School of Medicine; here are few of his 50-year hopes and expectations based on UCalgary's focus of current cancer research:

- ➊ I can imagine that, one day, we'll have tools to detect and treat nascent cancer on the pancreas, for instance, before it would be obvious in a CT scan.
- ➋ We're testing the idea of a low-dose CT scan of the lungs to detect lung cancers early in people.
- ➌ I like to imagine that a day will come when you could take a tablet to eliminate your susceptibility for a genetic disease. Rather than undergo a double mastectomy, for instance, you would negate an inherent risk of developing breast cancer by taking a daily tablet, just as you would take medication for high cholesterol or diabetes.
- ➍ The dream for brain cancers in infants, children and adolescents would be to learn what might put them at risk during fetal development. I've often wondered if it's some subtle maternal exposure — something in the environment, the diet, some incidental illness. If we could learn what it was, we could prevent it — just as spinal abnormalities are prevented by taking folic acid during pregnancy. What if we could prevent brain cancer in the same way? — JM





IN 50 YEARS, WHERE WILL WE BE?

Walk, E-bike, Hop a Drone

We tapped five transportation engineers for insights into how we'll move around Calgary in 2067

Fabiola MacIntyre, BSc (Eng)'03

Manager of Calgary's largest infrastructure project, the Green Line LRT:

At the helm of a city-shaping project that will add 40 kilometres to Calgary's existing 59-km LRT system — connecting Keystone Hills and Seton to downtown — MacIntyre points out that, in 50 years, the city will welcome 1 million more people.

"We need to think about moving those people and moving them efficiently," she says, "as we'll be serving about 41 million riders every year."

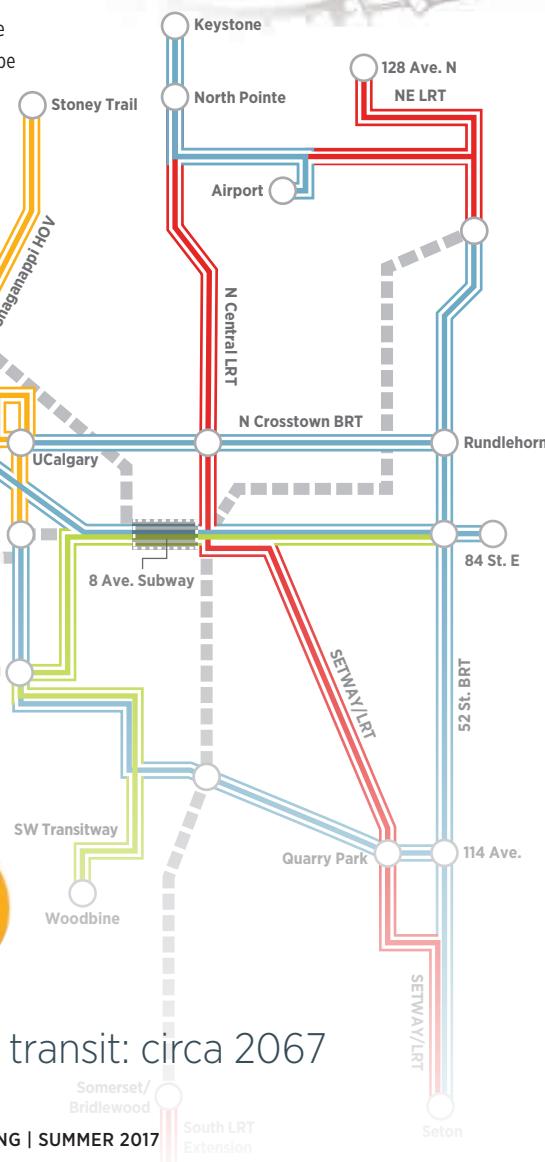


MacIntyre sees the Green Line as a key piece of a giant puzzle, with Calgarians having the option to live in vibrant, walkable and dense communities where they work, play and move by multiple modes, all interconnected by public transit. MacIntyre, who will be 86 in 2067, hopes that, in 50 years' time, she'll still be "riding a bicycle to see my grandkids, hopping on transit to go visit my doctor across the city or using it to go see a play."

Will transit service be 24/7 in 2067?

Perhaps, if the demand is there, say our experts, but when would track maintenance, currently performed in the wee hours, be done?

Calgary transit: circa 2067



Eric MacNaughton, BSc (Eng)'99/BA'99

Transportation co-ordinator for the City of Calgary's Climate Change Program:

The Driverless Electric Car – Electric cars will be autonomous (driverless) and shared, a boon to the environment and road safety. Using a smart phone or an app, you'll call for an e-car to fetch you. At your destination, instead of leaving it to rust on the street and rack up parking fees, it'll whisk off to its next call or to a central garage for maintenance. Forget plug-ins; by 2067, vehicles will recharge as they drive via a dynamic wireless charging infrastructure embedded in streets.

Extreme Weather – Climate change will make walking and cycling even more attractive because Calgary winters will be shorter and warmer. Summers will lengthen. We now have four days each summer of above 30 degrees; forecasts call for 25 to 30 days above 30 degrees by 2070. The downside: more extreme weather, with unpredictable dumps of snow and ice storms. Slick pavement might be de-iced by running geothermal power under it, as they do in Reykjavik.

Multi-modal Movement – Say you live in Tuscany and want to explore Fish Creek Provincial Park. Ride your bike, fold it up at the nearest BRT stop, transfer to the LRT leg south and catch an e-shuttle to get from station to park. (Autonomous minibuses will fill in the gaps between mass transit and cars.) Bicycle all day in the fresh air. Too pooped to retrace your steps? Hail an autonomous ride-share service, kitted out with a bike rack, to transport you home.

Elevation 200m
Slower Drones
Use Bottom Lanes



Blanka Bracic, BA'01, BSc (Eng)'01, MA'04

Currently on leave from the City of Calgary's Transportation Planning business unit, Bracic is living in Amsterdam, in her second year of another master's degree:

Not a Fringe Activity – In Amsterdam, the epicentre of urban cycling, Bracic says she gets “to experience what policy decisions we've made in Calgary might look like in 50 years.” Already, Calgary's downtown cycle track pilot has seen more women, children and older adults using it and, by 2067, she predicts cycling will be accepted as a perfectly normal way to get around. “It'll just be part of how we live,” Bracic says.

E-Bikes and More – Electric bicycles, or e-bikes, will become de rigueur, especially for long commutes and for older folks or those recovering from injuries. Turn the electrical assist on and off as needed! Expect to see e-cargo bikes used for heavy loads and family transportation, as well as all manner of personal mobility devices such as mopeds and other two-wheeled vehicles and hoverboards.

Lina Kattan

Urban Alliance associate professor at the Schulich School of Engineering:

New Frontiers – Mass transit and autonomous vehicles represent the brave new future, but we'll need to be far more proactive in planning for the coming transportation revolution, says Kattan. For every shiny future upside, there's a potential downside. Self-driving vehicles might prompt people to live in Canmore (and work while commuting), creating more urban sprawl. Likewise, regional trains move commuters, but also encourage spread. Ordering groceries online saves you a trip, but there's still a delivery vehicle (or drone) on its way to you.

Toggling Transit – And the revolution won't happen overnight. Kattan is researching what might happen to traffic and safety when you mix manual vehicles with autonomous ones. Will we still need driver's licences? “We need to know how to avoid problems,” she says. “We need more research.”

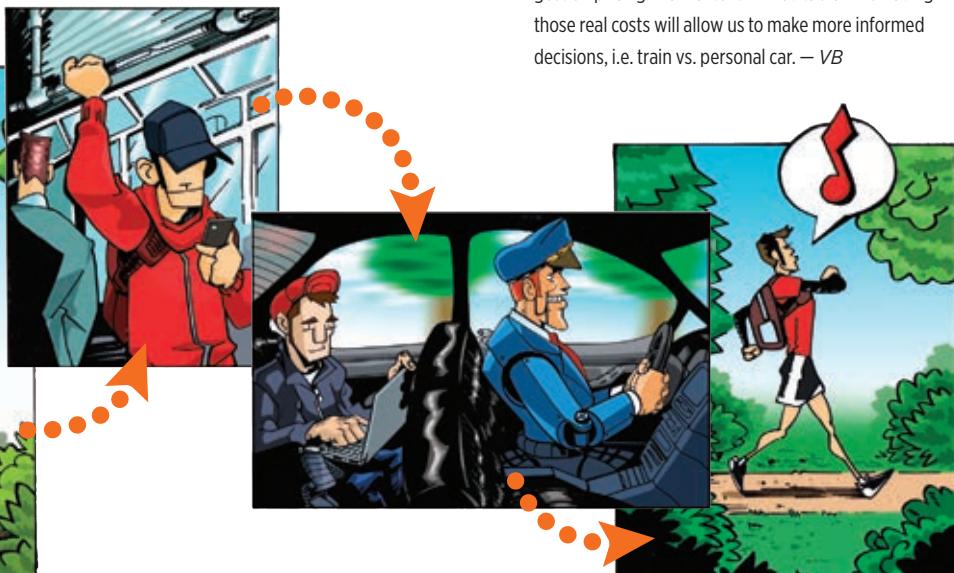
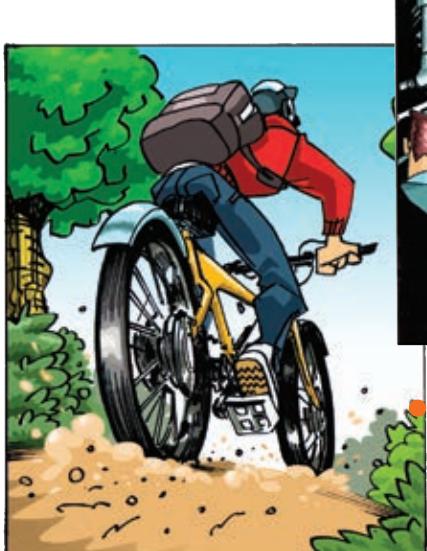
Saeid Saidi, MSc'11, PhD'16

Schulich School of Engineering research associate and former traffic planner:

Droning On – In the near future, drones will be used for sending and receiving shipments. But passengers? France's Airbus plans to flight-test self-piloted flying vehicles for individuals and cargo at the end of 2017. This might reduce congestion on roads, but create congestion in the air. The technology will be there, says Saidi, but regulations will have a hard time catching up.

Transit Rings, Not Ring Roads – Ring roads encircling the city are helpful to freight vehicles and others bypassing Calgary, but they only feed more inefficient urban sprawl. Crosstown transit and transit rings within the city's transit network will improve the efficiency and ease of travel for those who, say, live in the northeast and go to university in the northwest; they won't have to travel downtown and back out again.

Smart Pricing – We'll have exact knowledge of our trips: travel times, energy and maintenance costs. Cities will calculate the precise cost per vehicle, making congestion pricing – a.k.a. tolls – inevitable. And having those real costs will allow us to make more informed decisions, i.e. train vs. personal car. — VB





IN 50 YEARS, WHERE WILL WE BE?

Hot 'hoods of the Future

In 50 years, our walkable neighbourhoods will be interconnected by public transit, on-demand autonomous vehicles and drones. Here, two University of Calgary experts — Jyoti Gondek, MA'03, PhD'14, director of the Westman Centre for Real Estate Studies in the Haskayne School of Business, and Josh Taron, associate professor of architecture with the Faculty of Environmental Design — share glimpses of future housing and 'hoods.



Come Together

Forget the monoculture with houses here and shopping and work way over there. "We've got land-use policies that were designed for separate uses," says Gondek. "In the future, we need to look at social behaviour to mix uses effectively." A prime example is UCalgary's own University District; its plans call for a K-12 urban school located in a multi-use building, next to a park, so that children in the 'hood can walk or ride their bikes while their parents can get to grocery stores, recreation facilities and offices on foot.

Under One Roof

Multigenerational families — groups connected by blood or by choice — will increasingly live together, predicts Gondek. "Social isolation will be seen as important a reason as medical or physical assistance for living in closer quarters." It's already happening in Conrich, a hamlet east of Calgary, where some southeast Asian families are buying farms and building homes suitable for extended families, with multiple kitchens and several master suites for parents, grandparents and other relatives.



Hipster Central

Downtown's office towers could be revitalized by artists and hipsters bringing galleries, shops and design collectives to low-rent spaces on the ground floors, with a mix of offices and apartments upstairs. Even cooler? Power these vertical villages with renewable energy from the sun, wind and geothermal — plus, reuse grey water for rooftop greenhouses.

People's Needs First

Don't want to live in a high-rise? The City of Calgary's new R-CG land-use designation mixes cottage-style housing "clusters" — cottages grouped around an open space — with row housing, duplexes, secondary and backyard suites for less-intrusive density. "With these options added to the standard detached single-family home, neighbourhoods will be able to accommodate evolving household needs," says Gondek.

Call it 'Chunkitecture'

Prefabrication is the way of the future, Taron says. Chunks of houses — walls, floors, stairs, roof — will be built in factories, the pieces nested together and transported to the lot. "Within six hours or less, they'll be craned into place, bolted together and the electrical and plumbing plugged in," he says of the form he dubs "chunkitecture."



Put it Together, Take it Apart

Eventually, prefabrication will allow housing to expand and contract with people's lives. A young couple might start with a basic kit: a kitchen, living area, bedroom and bathroom. Instead of selling and moving as they expand their family, they'll add modules, maybe another bathroom or a couple of bedrooms. "Over time, as the kids grow up and move out, the couple could put those modules back into a secondary market to recover costs," Taron says. "It starts to address problems such as affordable housing as resale chunks would be more affordable." — VB



The Energy Systems of the Future Clean & Green

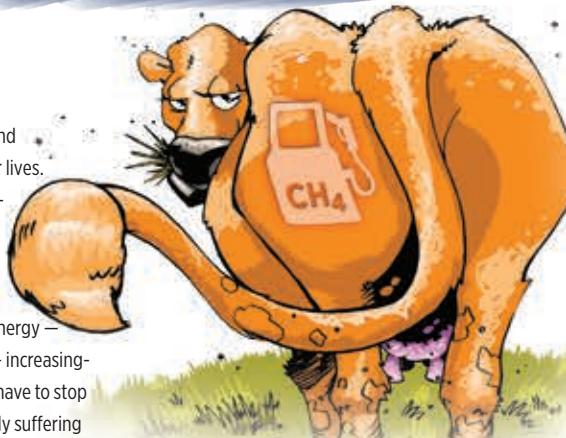
The Wind and the Sun

While solar panels and windmills may never decorate every home in Calgary, sun and wind will be increasingly relied upon to power our lives.

David Wood is the NSERC/ENMAX Industrial Research Chair in Renewable Energy at UCalgary's Schulich School of Engineering. He expects the number of wind farms to increase significantly as renewable forms of energy — wind, solar, biofuel, geothermal and more — increasingly replace oil, gas and coal. "We're going to have to stop using fossil fuels because the world is already suffering serious climate change," Wood says. (That said, he believes fossil fuels will still be in use in 2067; wind turbines are made from steel, which uses coal. "There are currently no alternatives for that.")

Likewise, solar power will soon be an essential energy source for Alberta. Jonah Zankl is a fourth-year student in mathematics and economics who once managed UCalgary's Solar Car Team; he now serves on Fuse Collective, a student organization devoted to sustainability issues. Zankl points to advancements in conductive, transparent film that can be used to glaze windows and harness the sun — a far cry from the clunky solar panels we have now. He expects a growing focus on finding better solutions to bottling and storing sun power. "Putting millions of pounds of lithium-ion batteries around the province may not be the answer," says Zankl. "We'll need more efficient ways to store huge amounts of solar power when the sun isn't shining."

Indeed, the race is already on to develop next-generation batteries: Venkataraman Thangadurai, a UCalgary chemistry professor, recently made news with a safer, leak-proof rechargeable lithium battery the size of a button.



Bag It

About 10 per cent of Canada's greenhouse gas emissions are from crop and livestock production. One of those gases is methane, which sticks around for only a decade or two (not hundreds of years like carbon dioxide), but is more than 86 times as effective at trapping heat in the atmosphere than CO₂.

We say, put a bag on it by trapping methane — the primary component of natural gas — and using it as green energy. Scientists at Argentina's National Institute for Agricultural Technology have experimented with this very thing. Tubes are fed into a cow's digestive tract; they eat, and their gaseous burps are captured in inflatable bags on the animals' backs. Elsewhere, scientists are trying high-grain diets, fats and oils and anti-microbial agents to reduce ruminants' emissions.

At the same time, the methane or "biogas" that emanates from the manure generated by cattle, hog and poultry farms can be captured, put through a natural process called anaerobic digestion and used as a renewable energy source. In 50 years' time, perhaps most Alberta farms will be gas-powered in an entirely different way. — VB

Flyover Country

Steven Bryant, UCalgary's first Canada Excellence Research Chair in Materials Engineering for Unconventional Oil Reservoirs, describes what petroleum production might look like to people flying over Fort McMurray in the year 2067:

"You won't see any tailings ponds, because we've shown that a fascinating class of materials called ionic liquids can remove the slow-to-settle fine solids from those ponds — not in decades, which is the time scale in ponds now, but in hours. This process restores the water in the ponds to its original, uncontaminated state. Scaling up this discovery and developing it into a process that will return clean water to the river and solids into the reclaimed mines could revolutionize our approach to this legacy of oil sands production."

"In fact, ionic liquids can be used to separate solids from bitumen in a process that eliminates the tailings completely, so there's no need for new ponds when mining oil sands in the future."

"Wells and pipes for producing oil will still be visible because oil will continue to be a useful feedstock for making a variety of chemicals. But facilities for burning natural gas will be gone as alternative, low-to-no-carbon approaches for providing the energy needed to produce that oil will have been implemented."

"And a new type of conduit for carrying energy in new forms — as hydrogen, as electron carriers or as electricity — will have replaced some of the pipelines, as technologies that produce energy while leaving carbon in the ground will have been implemented at large scale. So Fort Mac will still be thriving, but it will bear little resemblance to today." — VB





What Might the Future Hold For Education?

We asked two professors to give us their thoughts about education in 50 years' time. One takes a big-picture view, the other zeroes in at the molecular level



The Macro View: UNIVERSITY EDUCATION AT LARGE

Technology will be at the heart of a major disruption in teaching and learning at the university level, says Jennifer Lock, PhD'04, professor and associate dean of Teaching & Learning in the Werklund School of Education at the University of Calgary.

When asked what the UCalgary campus might look like in the year 2067, Lock foresees a very "limited bricks-and-mortar presence. Partly, that's because the whole notion of where we go to work might change. People will likely have a virtual presence, working and studying from home," she says. "We'll have a smaller footprint and fewer buildings here, and there won't be as many people coming and going."

Those physically coming to campus might serve more administrative and management roles. Some learning and teaching may still be done on site, perhaps in research labs, but it will be augmented by technology and self-directed by students, much as professor Christian Jacob describes for medical students (see opposite page).

"I think the campuses of the future won't be bound by time, physical space or geography," Lock adds. "We'll be able to work and study around the world, with anyone around the world, without leaving home."

The whole notion of learning will expand far beyond what students receive during their time on campus. Lock believes they'll spend more

time learning and developing skill sets in community placements or work environments where practice is brought to theory. Apprenticeships won't just be for tradespeople anymore.

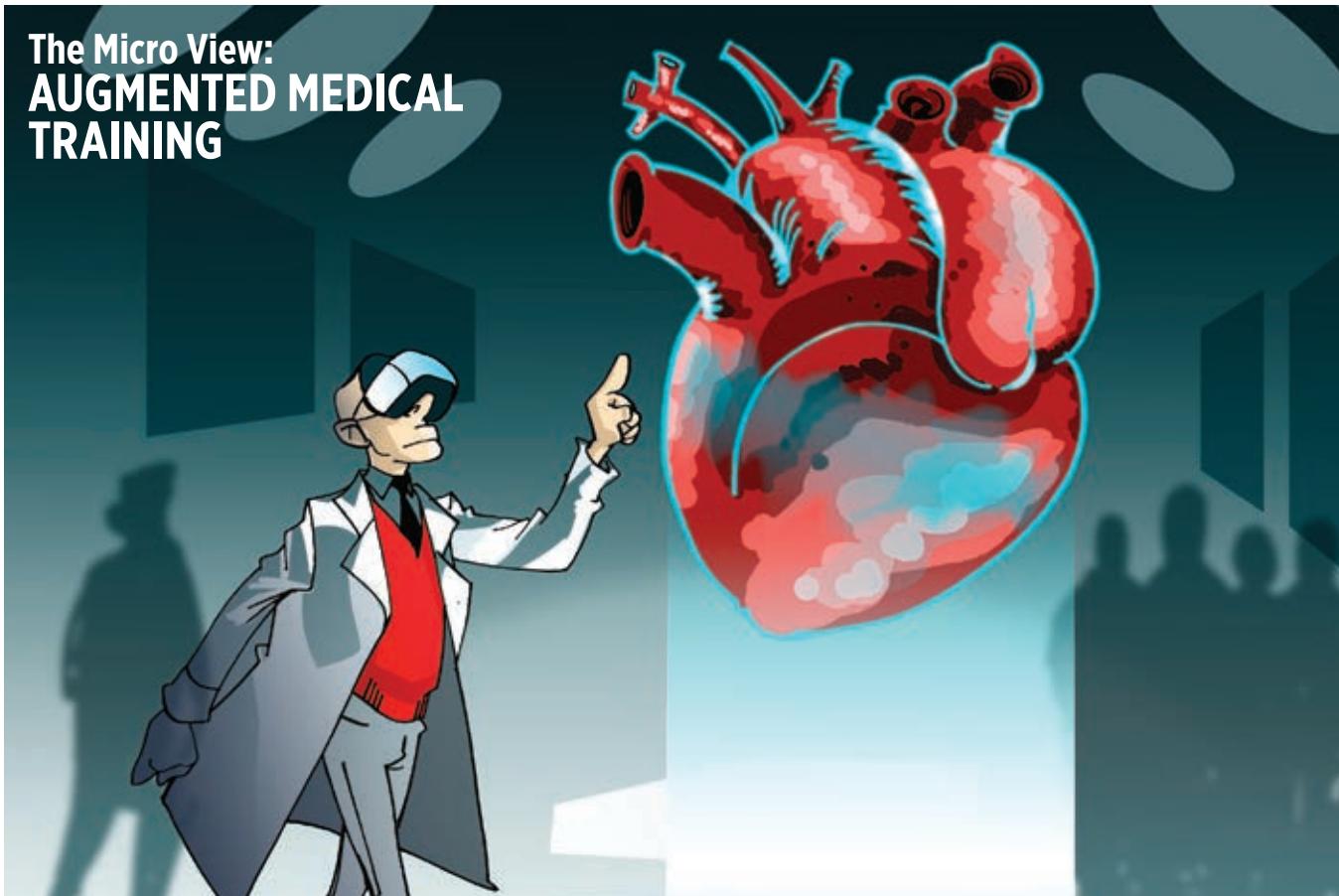
Travel and volunteer time — in different spaces and modes — might become important modules for credit. Likewise, massive online open courses (MOOCs), introduced in 2008, already offer alternatives to the lecture theatre. People tend to sign up for MOOCs, take what they need, but don't necessarily complete them, says Lock.

"That isn't necessarily a bad thing. Maybe they got just enough to form a building block of their learning about their area of interest, as opposed to taking 10 or 20 formal courses," she says, musing that students of the future might put together their own educational modules or even degree programs using both formal and informal learning.

If this brave new world upsets our existing ways of recognizing what people know and can do, how will credits and credentials be assessed? "It might be a performance piece, where I demonstrate my knowledge. Or, perhaps I present a series of portfolio pieces or I do a mentorship," explains Lock. "It opens up a potential wealth of ways of demonstrating knowledge, skill sets and competencies."

Whatever the future holds, she says it's important to continue to offer "rich, robust learning experiences." — VB

The Micro View: AUGMENTED MEDICAL TRAINING



By 2067, it will be old hat for medical students to virtually “fly” through the human body, “see” its diseases up close and plumb the depths of its cells.

Indeed, the future of medical education is already here, says Christian Jacob, a UCalgary professor in the departments of computer science and biochemistry and molecular biology.

Jacob’s current work combines virtual reality (VR) and augmented reality (AR) with computer-game engines to immerse students around and inside the human body. Jacobs and his colleagues have already created *HoloCell*, educational software that allows users to explore a 3D simulation of the inner workings of a human cell.

In essence, *HoloCell* combines holograms with AR to provide a live view of the real world in real time, augmented with computer-generated sound, video or graphics (think *Pokémon Go*). Jacob hopes a version of *HoloCell* will be used to enhance teaching in alumnus Reed Ferber’s anatomy lab in the Department of Kinesiology this fall.

The long-term plan is to expand the software to build immersive experiences of the entire human body for many educational applications. For example, medical students could dissect a real heart while using AR lenses (picture a big set of ski goggles) to see a 3D heart hologram floating nearby, take it apart virtually, and then watch it pump blood through different heart conditions, such as a heart murmur.

And, while peeling back the muscles with their fingers and instruments, a voice interface could converse with them: “Go further; what else do you see?” This type of self-directed learning, using real tissue along with other technologies such as touch interfaces, will

revolutionize medical training, Jacob says. For one, fewer instructors would be required.

As software and hardware continue to improve and the costs decrease, patient education can benefit, too. If knee surgery is needed, both doctor and patient might put on AR gear to see a CT scan projected over the patient’s actual knee. The doctor could explain why surgery is needed and then show what’s involved, using a hologram. The patient’s chart might pop up in another hologram. They’d be able to have a conversation, see one another and see these tools.

“I like AR because it’s blending computers into our real world, without hiding things behind a screen. We can bring digital contents from the computer into the real world,” Jacob says. He envisions a time when we’ll be able to activate computer menus and make choices by gesturing or through voice command.

If the future is already here, Jacob muses, medical studies in 2067 might look something like the medical-drama TV series *Pure Genius*. Students could learn to use 3D printers to build artificial organs, deploy swallowable nano-devices to identify cancers and program “diabetic robots” to monitor and deliver insulin.

Augmentation and artificial intelligence will assist medical students and their future patients.

“We’ll know much more about ourselves, simple things like blood pressure and weight, through sensors which will gather data, and that data will be accessible to our doctors,” Jacob says. “We won’t even have to go to the doctor unless an alarm goes off for, say, our blood pressure.” — VB



Either the Best or the Worst Thing Ever

Despite its long and lofty status in Hollywood, the field of artificial intelligence is — at 60 — a relatively young field of study. Where the next 50 years will take it is up to you

A recent study out of California looked at the potential influence of artificial intelligence on the typical North American city 20 years from now. How, researchers asked, will A.I. innovation affect education, health- and elder-care and public safety? Not only that, but how will automated machines affect our acquisition of personal goods (a.k.a. shopping) in 2030?

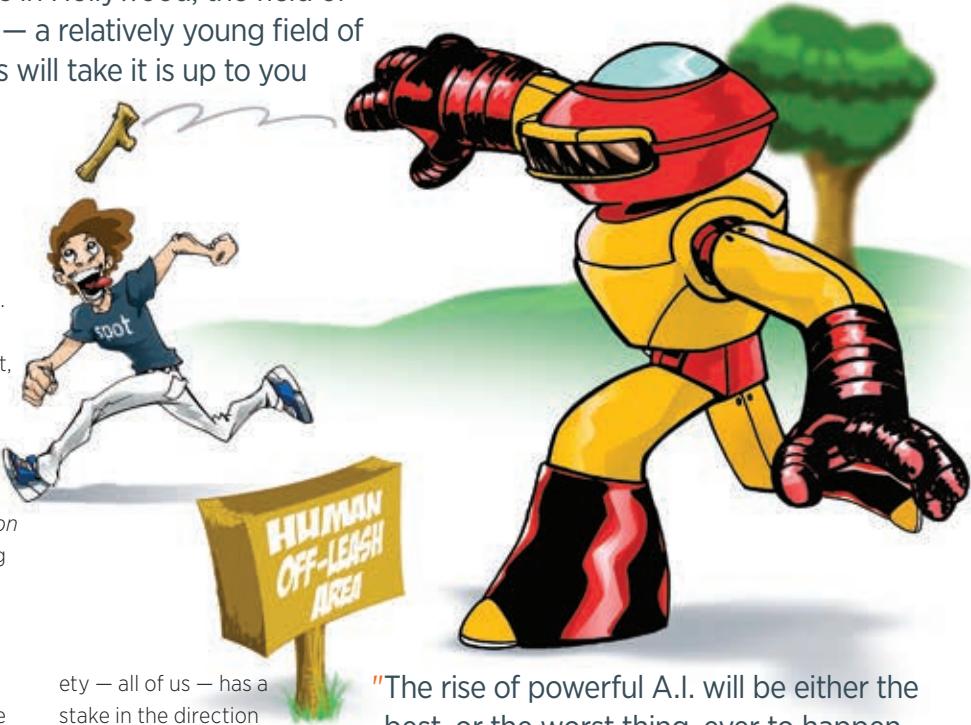
"They will facilitate delivery of online purchases," the *One Hundred Year Study on Artificial Intelligence* reads, "through flying drones, self-driving trucks, or robots that can get up the stairs to the front door."

Um, is it just us or does the last part of that sentence give you the creeps?

Indeed, often twinned with our collective fascination with a technology inspired by our own brains and bodies are feelings of revulsion toward a potentially dystopic future ruled by superhuman cyborgs that can do everything we do — only faster, more logically and with fewer coffee breaks (you did see *Robocop*, right?). While that might be an out-there overreaction given that many of us happily benefit from relatively harmless advances in A.I. every day (say hello, Siri!), the future of the discipline depends largely upon our humanoid responses to it.

It's that tension between what A.I. can do and what humans are willing to let it do that is of particular interest to Jorg Denzinger, an associate professor of information and communication technologies at UCalgary. Asked to speculate on the 50-year future of the discipline, Denzinger frames his answer around ethics and societal perceptions.

"A key thing for how the future of A.I. will develop is acceptance," he says. "Soci-



ety — all of us — has a stake in the direction that knowledge-based systems take us."

Regardless of the fact that robots could, for instance, do all manner of manufacturing processes, humans stand to lose jobs we may not be willing to give up. It's the flip side of Agent Smith's directive in *The Matrix*:

never, in the name of avoiding redundancy, send a machine to do a human's job.

Interestingly, for a guy whose career is devoted to A.I. research, Denzinger's "big dream" for 2067 is not the dawn of routine human head transplants or an army of robo-waiters with Genuine People Personalities. Rather, his hope is more sociological — more, well, human: he wants to see a shift in society that creates space for open discussion around the norms, laws

and ethics of A.I. in every field. Denzinger points to the uncharted territory of the driverless car industry as an example how an informed, engaged and empowered

"The rise of powerful A.I. will be either the best, or the worst thing, ever to happen to humanity." — Stephen Hawking

society is key to ensuring A.I. innovation is helpful, not harmful.

"There will be situations, for instance, in which a self-driving car has to make a decision relating to an imminent collision within which an unknown number of people will survive," he says. "The more the car knows about the car with which it might collide, the better, but the question for the autonomous vehicle is: Who will survive? And why — based on what? How does a car evaluate the 'worth' of the people in the cars?" Researchers like Denzinger must rely on society to inform the formulas upon which such A.I. knowledge is based. "If there's no discussion, starting with our politicians, about those kinds of ethical parameters in our society, then, when there is an accident, the industry is blamed. There's enormous potential for disruption."

Everyone, he says, "should think and care about these kinds of implications." Certainly, HAL-9000 would care. Do you? — JM **U**

UNLOCKING SKILLS THE POWER OF BRAIN GAMES



Don't scoff.

Those gamers holed up in basements might well become tomorrow's brain surgeons. Research indicates the "training" players receive through video games may provide just the job skills they'll need in the future.

by Jennifer Allford

When her teenaged son, Noah, was just a little tyke, Lisa Garcia, BEd/BA'95, was ashamed to tell her friends how much time he spent playing video games — a few hours after school and up to eight hours a day over the weekends. “I lay awake at night and I hid it from my friends,” she says. “It was not acceptable to them and I know their attitude reflected society as a whole and they reflected what I believed in as well, yet . . .”

Halfway across the world in Singapore, Nathaniel Tan’s parents weren’t exactly thrilled about his gaming, either. But the science grad loved it: “I distinctly remember my first game being a SHMUP — shoot ‘em up — and the first time playing it, I just got decimated.” He was six. Maybe seven. Tan, BSc’13, now development director at Calgary-based Peak Pixel Games, remembers the thrill of the flashing lights on the screen and the drag of having to listen to a lot of negative comments from his parents. “I sure did hear about it in a derogatory way on an almost daily basis,” he says. But hold up. Turns out growing up gaming can take you well past Level 7. Unlocking achievements on the screen can also unlock the skills you need to become a brain surgeon, creative problem-solver or the finder of the next great scientific discovery.

PLEASE PLAY ON

“If your kids like computer games, let them play these games. They really help us as scientists,” says Christian Jacob, professor of computer science, biochemistry and molecular biology and director of LINDSAY, a virtual 3D human simulator at UCalgary. As gamers expect more powerful games, developers load them up with more technology, and scientists like Jacob can use that technology to further their own work.

“When you play computer games, you are helping science,” he says. As gamers work at racking up points, the graphic cards get faster and the software tools get better. Scientists, like Jacob, use that technology to build computational simulations with fully immersive experiences. “Imagine,” he says, “you can literally walk through your body, explore physiology or look at your data sets as holograms.”

Some gamers even jump in and help solve scientific problems. More and more crowdsourcing sites ask gamers to virtually fold proteins or bend molecules, work that often beats the researcher’s algorithms and helps make biochemical breakthroughs. Players from one such site, Foldit, have been credited as authors in several papers in the prestigious journal *Nature* (one of the credits reads Foldit Void Crushers Group).

“You can certainly solve some of the scientists’ problems with games,” agrees Beaumie Kim, associate professor at UCalgary’s Werklund School of Education. “They take it to the gamers because they can solve a puzzle really well.” Many gamers even learn to



“When you play computer games, you are helping science.”

— Christian Jacob

of how things work,” adds Kim. “They engage in a lot of creative practices because they have to understand the context; they have to strategize.”

While Noah Garcia’s mom was worrying about her son being glued to his controller, the 16-year-old was using it to learn about history, warfare and, most recently, the rise and fall of empires playing a game called *Civilization VI*. “You can play as Rome, Greece, Napoleonic France,” he explains, “and you can choose what kind of victory you want — you can conquer the world, or you can create the United Nations.”

And whether he’s roleplaying as a soldier in the First World War or as an emperor in an ancient civilization, Garcia is also learning to think on his feet. “I think it made me a lot better at making decisions because you have to think fast when you’re in the game,” he says.



Game of Algorithms: Gaming as Teaching Tool

Students in UCalgary's Schulich School of Engineering are building video games to learn how to develop algorithms, absorb all kinds of technical content and boost their creative thinking.

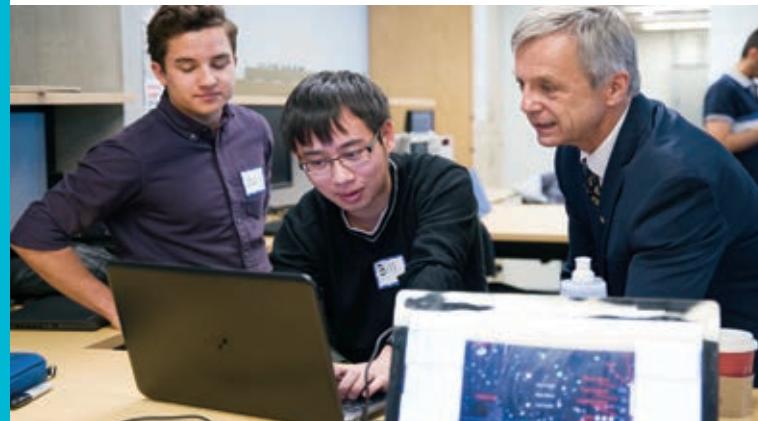
Electrical and computer engineering students are developing simple games such as designing floor plans to minimize wasted space and figuring out the best way to move through grocery store aisles — efficiencies that are also important for electrical engineers when they design circuits.

Laleh Behjat, associate professor in electrical and computer engineering and Emily Marasco, BSc'11, MSc'13, a PhD student in the department, have redesigned a fourth-year algorithm development class, ENCM507, to incorporate games. Along with other researchers across campus, Beaumie Kim, associate professor at the Werklund School of Education, and Mohammad Moshirpour, BSc'08, BSc'09, MSc'11, PhD'16, an instructor in electrical and computer engineering, are studying how building games in class increases student engagement.

"Games are meant to be entertaining, they're meant to attract people. If students are playing games, let's turn education into a game," says Marasco. "Games most certainly boost students' creativity. I'm always amazed by what they come up with."

Creativity is essential for engineers, Behjat adds. "Integrating creativity and innovation into technical content will enable engineering students to create innovative designs, tools and techniques that have not been even dreamed of yet. This will lead us into the future with many possibilities and opportunities."

The students have to program a game that's based on the algorithms used for designing computer chips and includes scoring and different levels of play. "I am always blown away with how much effort and time these students put in because they want to," says Marasco.



Top left: Emily Marasco (left) playtests gaming solutions with first-year students.

Top right: Robert Thirsk, BSc'76, LL.D.'09 (right), and first-year students review their gamified learning project.

Above: Screen captures from two of the fourth-year-designed gaming solutions, *Galaxy Theft* (left) and *Escape the Cold*.

Below: Laleh Behjat (left) and Emily Marasco.

"Games most certainly boost students' creativity. I'm always amazed by what they come up with." — *Emily Marasco*





Prof. Garnette Sutherland sits at the helm of the neuroArm, an innovation in surgical procedures.



Nathaniel Tan turned his passion for gaming into a thriving business. His first app is *AlexG Infinity*.

GAMER TODAY — SURGEON TOMORROW

Sitting in the basement with the Xbox could well take you to wearing scrubs in the OR.

"I think the video gamers of today have the potential to become better surgeons of tomorrow," says Garnette Sutherland, professor of neurosurgery at the Cumming School of Medicine. "Surgery has become very image-dependent."

Sutherland, in collaboration with MacDonald Dettwiler and Assoc., invented the neuroArm, a groundbreaking surgical robot that, through image-guidance and robotic manipulators, lets neurosurgeons operate on a patient from across the hall, across the country, or even at the *International Space Station*.

In 2009, Sutherland and research student May Choi wanted to find out if playing video games impacted surgeons' training on the virtual reality simulator for the neuroArm. So they brought in groups of video gamers, medical students, surgical residents and qualified surgeons to sit down at the simulator and build virtual snowmen, remove "tumours" from a box without touching the edges — and even thread a needle.

The gamers left every other group in the dust, outperforming them at almost every turn. "We know that those gamers have a hand controller and they're manipulating it in a virtual environment," says Sutherland. "To control a robot, you're in both a virtual and real environment, but you are using a hand controller. So, if you had practised a lot with hand controllers and video games, you are going to, invariably, be better at operating a robot remotely."

FROM PLAYING TO BUILDING GAMES

By age 10, Tan was spending a lot of time gaming and he already knew he wanted to build games for a living — he reasoned that'd be cheaper than buying them. Right about that same time, his teachers in Singapore were telling his parents that Tan's marks weren't good enough to get him through junior high in the hyper-competitive Southeast Asian school system. So the family moved to Canada. Two years after graduating from UCalgary, Tan's game, *AlexG Infinity* (another shoot 'em up) launched on iTunes and Google Play. "I rarely play video games now," says Tan. "I find I prefer making and developing games more than playing them."

Tan, who is pursuing a master's degree in computer science at UCalgary, says his parents are no longer concerned about his Grade 6 marks not being good enough or that gaming is bad.

Lisa Garcia doesn't worry about her son's gaming anymore, either. "Over time, I learned to let it go because the negative things that were being said were going to happen to Noah, never did," she says. Noah gets good marks, spends time on other interests and has plenty of friends.

While there are legitimate concerns around people becoming addicted to video games (see sidebar, next page), most media scholars refute the notion that gaming (or other media) is responsible for school shootings, violence or misogyny. "It's not these games that are causing this behaviour," says Jessalyn Keller, an assistant professor in the Department of Communication, Media and Film in the Faculty of Arts. "But they are, in part, reflecting a sentiment that



When Does Gaming Become a Problem?

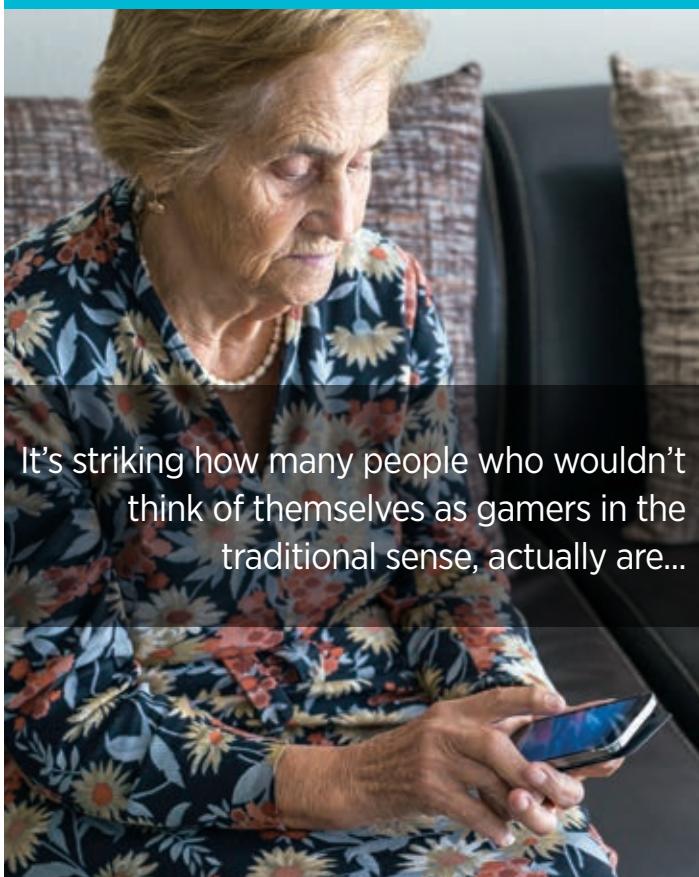
Video game addiction is not considered a psychiatric disorder. At least, not yet

"Our understanding of video game addiction is still in its infancy," says David Hodgins, professor of clinical psychology and director of UCalgary's Addictive Behaviours Laboratory. "But anecdotal evidence and early research, some of which has been conducted at UCalgary, confirms that some individuals play video games in an addictive and harmful manner."

The American Psychiatric Association reports the need to conduct more research into gaming addiction. In the meantime, it has included "Internet Use Gaming Disorder" in an appendix of its latest *Diagnostic and Statistical Manual of Mental Disorders* (DSM-V), along with criteria that characterize the hypothetical psychiatric disorder:

- Preoccupation or obsession with games
- Symptoms of withdrawal including irritability, anxiety or sadness
- Unsuccessful attempts to cut down or stop play
- A loss of interest in other activities
- Lying to others about the amount of time spent gaming
- The development of tolerance, leading to the need to play longer for the same effect
- Continued excessive use, despite knowing that it is causing problems
- Using gaming to relieve a negative mood, like worry or feeling sad or lonely
- Jeopardizing or losing a significant relationship, job or educational opportunity

A self-confessed gaming addict and entrepreneur, Calgarian Cam Adair, recently turned his troubled life around by launching Game Quitters — a support community for video game addiction. Curious? Visit gamequitters.com.



It's striking how many people who wouldn't think of themselves as gamers in the traditional sense, actually are...

already exists in society. It's a lot easier to blame a video game than it is to deal with larger structural inequalities and issues."

It's also clear it's not just kids who like to play video games. Grandpa playing solitaire on a tablet and mom killing time with *Angry Birds* on her phone are also partaking in the massive global gaming industry. "It's striking how many people who wouldn't think of themselves as gamers in the traditional sense, actually are," says John Aycock, BSc'93, associate professor of computer science.

Games have come a long way since 1950 when a Canadian engineer built one of the first computer games, a four-metre-tall tic-tac-toe game called *Bertie the Brain*, for the Canadian National Exhibition in Toronto. Nearly 70 years later, gaming is a \$3-billion industry in Canada. And it's growing.

As well as training would-be brain surgeons and advancing science, gaming is helping students learn (see sidebar, page 43) and benefiting a long list of other sectors. "Continued research in practical utilization of video game playing has also shown positive benefits in training, education and rehabilitation," says Tan. "They're a unique blend of art, science and business."

And, well, video games are fun. "We were playing games long, long before computers came along," says Aycock. "We've applied computers to this problem of playing games and we will continue to do so in the future. One of the basic things that humans like to do is play games." **U**

Gotcha!

Any group of subversive students can wrap campus trees with toilet paper or plaster the president's office in Post-it notes. These following pranks, larks and calamities throughout UCalgary's history went above and beyond — and that's what makes them the stuff of mischief legend.

by Deb Cummings

illustrations by Jason Esteban



Be Careful what You Teach

On April 3, 1988, an engineering prof used the university's iconic red arch as an example of something that would never support a car. His students proved him wrong. The next morning, a red Honda Civic was suspended from the arch, dangling over the traffic. Since no one had, until that moment, figured out the calculations needed to safely raise the car, no one knew of a safe way to lower it. What took the students mere hours to accomplish took more than a day for the "experts" to undo — with the help of a crane.

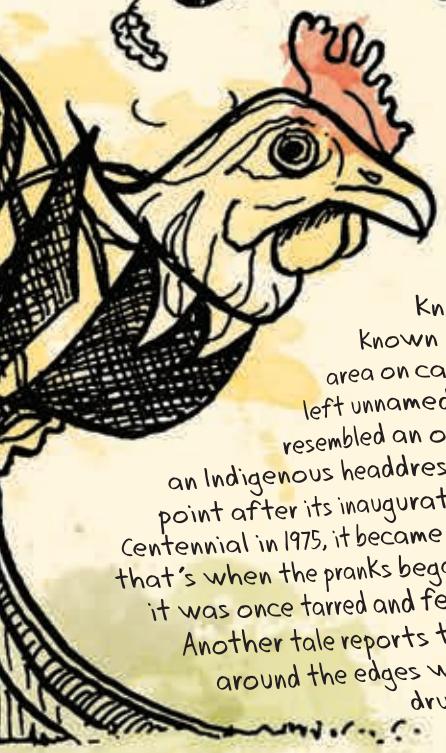


Rock of the Ages

As far as we know, you can't actually major in pranks at UCalgary. But, if you were an engineering student in the 1970s and '80s, you may have come close. Back then, the rivalry between UCalgary and the University of Alberta was legendary — epic enough that "The Rock" was actually stolen a couple of times by marauding U of A engineering students. At one point, UCalgary said "enough!" and put a stop to the late-night heists by pouring concrete around the rock's base, turning it into a steadfast cube. Undaunted, the U of A students attempted to free the rock from its concrete cage with explosives. They failed. Today, if you look at the base of the rock, you'll spot a square shape — a leftover of the day the students cemented their beloved boulder to the ground.



What the Cluck?



Fondly dubbed the Prairie Chicken, this 18-ft.-tall, 4.5-ton stainless steel sculpture by George Norris sits atop a grassy knoll in what's

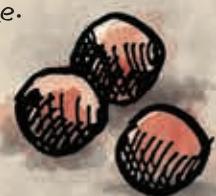
known as the Swan Mall area on campus. Originally left unnamed, some thought it resembled an opening rose, others an Indigenous headdress, but, at some point after its inauguration during Calgary's Centennial in 1975, it became a chicken, and that's when the pranks began. Legend suggests it was once tarred and feathered by students.

Another tale reports that the metal runner around the edges was added to prevent drunken students from impaling beer cans on the spokes.



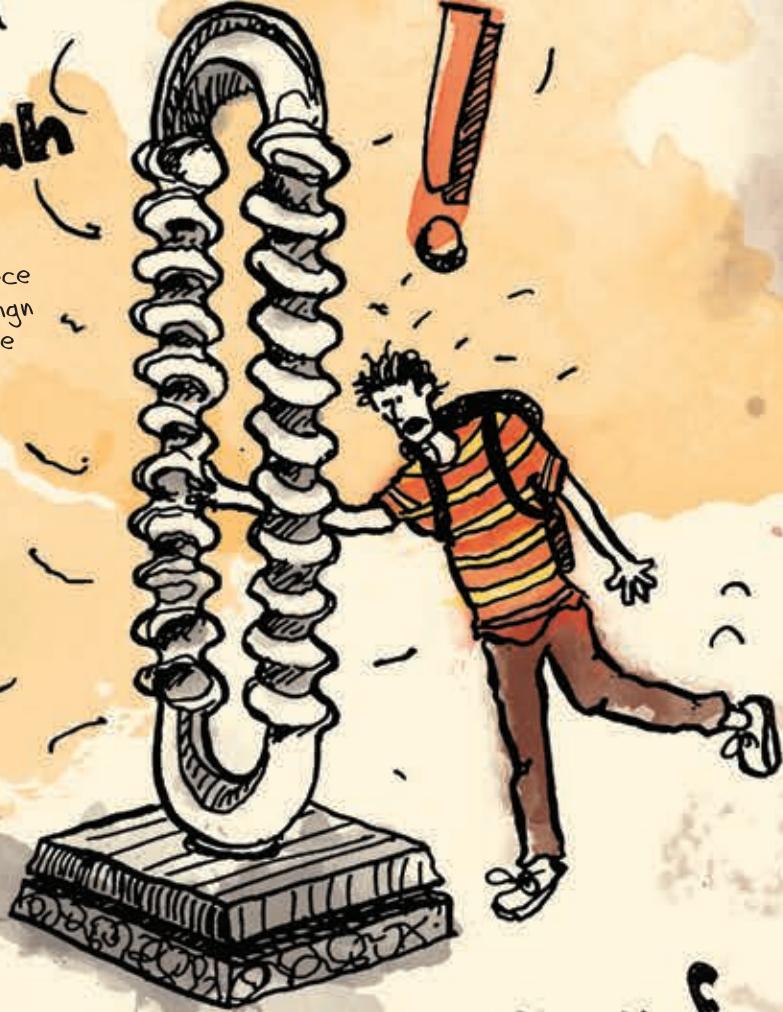
Social Climbers

Some pranks make you grin in quiet awe, while others make you laugh out loud. The day a group of students pressed squash balls into the side of the Social Science Tower back in the 1970s was one of the latter. Attempting to use the squash balls as hand- and toeholds as they scaled the tower seemed like a brilliant idea, until the pranksters realized the top half of the tower had a different texture than the rest. Splayed out on the wall, the students ran out of places to insert handholds and had to be rescued by the fire department. Look above the "E" and "N" letters in the Social Science Tower sign today, and you'll see the rubbery evidence.



Zip-a-Dee-Doo-Dah

Most university pranks have trivial consequences, but legend has it the swirly piece of public art known as the Zipper isn't as benign as its smooth exterior appears. If you spin the cylinder before an exam or presentation, it's known to bring you luck – not, however, if you're in engineering. Besides coating it in Saran Wrap, stealing it and building a car around it, the Zipper finally snapped back at an engineering student when said student stuck his hand into it while it spun. He broke his arm in three places.



Plants Are Addicts, Too

In the atrium at the heart of the Administration Building stand the statues of three philosophers – Plato, Socrates and Crito. Although today the atrium is a lovely indoor oasis, its past was a smoky one. However, that changed in the early '90s when the university banned all indoor smoking. The bizarre bit is that, as tough as it was for the smokers, it was harder on the plants inside the atrium. So addicted to nicotine had they become, they all withered and died of withdrawal, leaving the philosophers to ponder silently.



The Story of Joe Pillar

Decades ago, a group of engineering students schemed up a fake student by the name of Joe Pillar. Groups of students took turns posing as Joe Pillar, attending classes, completing his assignments and even writing his exams. By all accounts, Joe was a 4.0 student. Eventually, university administration caught on to these shenanigans and put an end to Pillar's academic career, but not before he came within three classes of completing his degree.

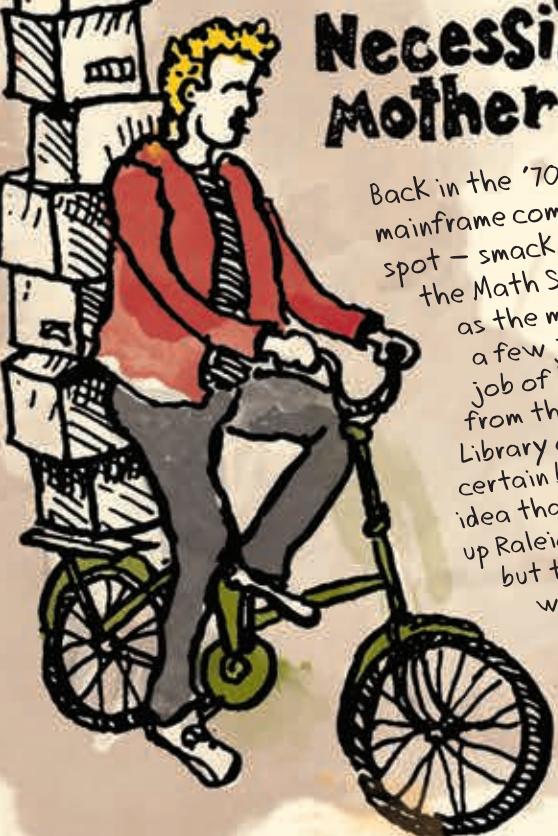


* Hop to It *

Anyone who's slogged up the 13 flights of the Social Science stairwell has read the words, scribbled on the risers, by a group of arts students from the '70s. Known as the story of Leon the Frog, his bizarre journey was hatched in Dinnie's Den and reflects his existential quest for identity, ending in light (at the top of the stairs). A metaphor for students "lost in space," Leon escapes dissection, crucifixion and sexual harassment. It's not too late to read about Leon's saga as it remains painted on the risers today.



Necessity is the Mother of Invention

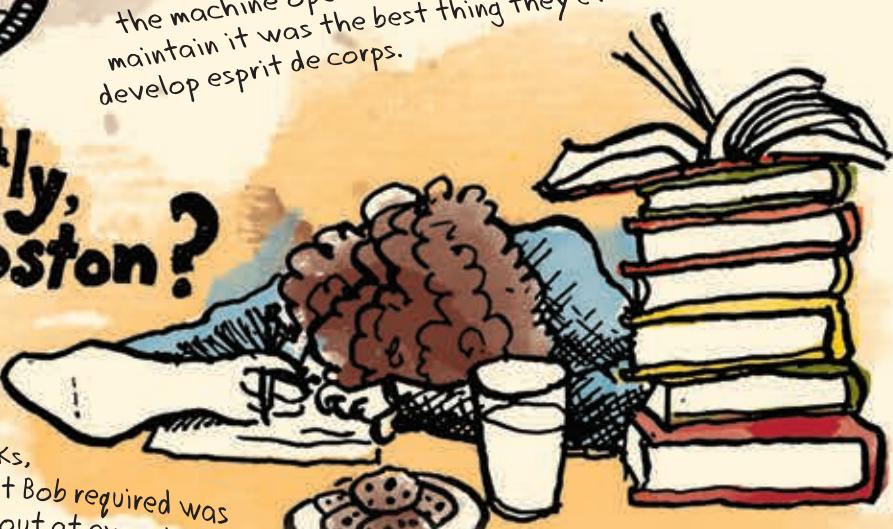


Back in the '70s, UCalgary's mainframe computers were housed in a central spot — smack dab in the middle of the basement in the Math Sciences Building in what was known as the machine room. In the summer of 1971, a few junior program analysts had the job of lugging 20-lb. boxes of punch cards from the Admin. Building and the Mackimmie Library over to Math Sciences. However, a certain boss by the name of Noel had the bright idea that these guys could use his green, fold-up Raleigh bike to transport the boxes. They did exactly that, but then found themselves waiting around for the results. So, with time to kill, the oblong hallway that wrapped around the machine room became a velodrome where nightly time trials were held between the analysts and the machine operators. With all corners being square, there were plenty of skid marks that baffled the custodial staff for weeks. To this day, both the program analysts and the machine operators have remained friends and maintain it was the best thing they ever did to develop esprit de corps.



Who, Exactly, Was Bob Boston?

Rumoured to bring gifts to weary students during final exams, this Santa Claus-like man allegedly blessed readers whose heads fell asleep in their textbooks, with the power of osmosis. All that Bob required was a platter of cookies and milk, left out at exam time.



Class Notes

1970s

Ratna Ghosh, MA'73, PhD'76, received the Distinguished Alumna Award at the 2016 Arch Awards. Originally from India, the award-winning educational leader, author and lecturer was the first female dean at McGill University's Faculty of Education from 1998-2004. Her numerous awards and honours include the Order of Canada (2000), the Order of Quebec (2006) and election as a fellow of the Royal Society of Canada (1999), as well as being profiled as one of *Time* magazine's "Canada's Best in Education" (2003).

Mike Shaikh, BComm'77, along with his wife, Linda Shaikh, MA'15, were named two of the *Calgary Herald's* 20 "Compelling Calgarians" to watch in 2017. Among the philanthropic couple's recent donations is the \$1-million gift to the new central public library, in keeping with their focus on promoting education. Mike, grandfather of seven, offers this advice to new students: "Think big and don't be afraid. Stay focused, determined, empowered and then get out there and use that education to build our country worthy of your boundless promise, energy and enthusiasm. Lead by example, with hope — never fear."

1980s

Larry Shelley, BComm'80, received the Management Alumni Excellence Award at the 2016 Arch Awards. Shelley's finance career has spanned decades as he has climbed the corporate ladder to come full circle as managing partner of Citrus Capital Partners Ltd. He currently serves as a board chair for the Beakerhead festival and has been a member of the Rotary Club of Calgary since 1993.

Suzanne West, BSc'87, president and CEO of Imaginea Energy, was not only one of the *Calgary Herald's* 20 "Compelling Calgarians" to watch in 2017, she was also the recipient of the Alumni Achievement Award at the 2016 Arch Awards. She has devoted her life to changing how we do business, mashing together planet, people and profit.

Jean Addington, PhD'87, and Hude Quan, PhD'98, both alumni at the Cumming School of Medicine, were named to the prestigious 2016 "Highly Cited Researchers" list compiled by Clarivate Analytics, formerly Thomson Reuters' scientific division. The list identifies the top one per cent of scientists whose research has had significant global impact in their fields. Addington is a professor of psychiatry who has concentrated on psychosis and schizophrenia for more than 20 years. Quan is a professor with the Department of Community Health Sciences and the director of the World Health Organization Collaborating Centre in Classification, Terminology and Standards at the O'Brien Institute for Public Health.

1990s

Dr. Pam Veale, MD'93, MDSc'00, received the Alumna of Distinction Award for achieving medical education excellence at the 2016 Arch Awards. Over the past 15 years, Veale has been a dedicated educator who is committed to creating a successful learning environment for future doctors. She has served as course chair, director of student evaluation and assistant dean, undergraduate medical education (UME), and played a key leadership role in the recent successful UME-accreditation process.

Dale Walde, PhD'95, received the Alumni Achievement Award for inspiring students at the 2016 Arch Awards. Walde says he got a "late start" in his academic career at the age of 27. He spent time in the private sector as a consulting archaeologist while he was finishing up his PhD and, in 1998, he entered academia, taking his first role as the director of UCalgary's Archeology Field School. In that role, he immediately initiated a public archaeology program, introducing several hundred members of the public to Canadian Plains archaeology and First Nations traditions.

Brad Mahon, BMus'96, MMus'99, PhD'08, was named director of the world-renowned Conservatory at Mount Royal University. Mahon will provide strategic leadership to one of the largest music and performing arts education organizations in Canada.

2000s

Grant Gordon, BKin'01; Lindsey Kindrat, BSc'01; Rahim Sajan, BSc'01, BEd'03; Megan Kerluke, BFA'02; Dr. Tony Truong, BSc'96, MD'02; Dr. Gabriel Fabreau, BSc'03, MD'08; Fabiola MacIntyre, BSc (Eng)'03; Connor Gottfried, BSc'04; Adam Melynk, BA'04; Mel-anne Thomas, MA'06; Adam Jones, BSc'07; Jessie Li, BComm'09; Kristen Lien, BA'06, MEDes'08; Kara Chomistek, BSc'10; Jim Sautner, MEd'14; Derek Roberts, PhD'15; and Breanne Sich, BComm'15, were all inductees into *Avenue Calgary's* 2016 Top 40 Under 40 for "blazing trails in research, creating spaces for us to marvel at and enjoy, championing education, saving lives, innovating technology, keeping us well-fed (and watered), promoting artists and the arts and helping those in need."

Leanne Pelosi, BSc'02, one of the most decorated female snowboarders on the planet, was named *Transworld Snowboarding* magazine's first-ever Influencer Award last December. Pelosi has done everything from compete in world-class competitions and running all-girls snowboard camps to producing films about the top female riders in the game.

Jane Salma Alkhouri, BA'03, received the Alumni Achievement Award at the 2016 Arch Awards. Her UCalgary roots as a student leader, writer for the *Gauntlet*, member of

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Read more alumni updates at ucalgarymag.ca/issue/spring-summer-2017/article/class-notes

political clubs and the senate, and later an employee, has taken her around the globe as a federal public servant with Global Affairs Canada. Among her many honours are the Government of Canada General Service Medal with one rotation bar and the GAC Deputy Minister's award medal for contributions to the resettlement of Syrian refugees (2016).

Dr. Margriet Greidanus, MD'03, and Laura Lucier, BSc'99, were two out of 72 candidates shortlisted for the Canadian Space Agency astronaut program. More than 3,700 people applied to be two of the country's "next generation of space explorers." The recruitment campaign began last June and the new astronauts will be announced in the summer of 2017. Greidanus is an emergency physician and trauma specialist at Foothills Medical Centre. Lucier is a robotics flight controller with NASA's Flight Operations Directorate.

Juan Riedinger, BA'05, BSc'05, and Julie Lynn Mortensen, BComm'08, BFA'08, both landed the starring roles in the movie *Drawing Home*, a locally shot biographical film about the love story of Banff artists and outdoor enthusiasts Peter and Catharine Whyte.

Tuan Trang, PhD'05, a neuroscientist, and his team, have discovered that an anti-gout medication can reduce the severity of withdrawal symptoms in opioid-dependent rodents. Their work is leading to the development of a clinical trial at the Calgary Pain Clinic. Their study was published in January in the prestigious journal, *Nature Medicine*.

Andrew Phung, BA'06, won Best Performance by an Actor in a Featured Supporting Role or Guest Role in a Comedic Series at the 2017 Canadian Screen Awards for the CBC series *Kim's Convenience*.

daniel j kirk, BFA'07, received the Alumni Achievement Award at the 2016 Arch Awards for his work as an artist in Calgary. A painter, a builder and a social entrepreneur, he splits his time between creating art in both his studio and abroad, and also maintains a focus on grassroots initiatives that blend art with the greater community good. He has led initiatives for at-risk youth through the Boys and Girls Club, Urban Youth Worx, the City of Calgary and more.



Photo courtesy Joseph Windsor

Qapla'! Speaking Star Trek

When he was a kid, Joseph Windsor, MA'12, fell in love with the Klingon language. Since then, not only has he gone on to become an expert speaker of it, he's built his academic career around linguistics.

First heard in *Star Trek: The Motion Picture*, Klingon has grown from a few phrases into a bona fide language with thousands of speakers around the world. There's an official dictionary, a translated edition of *Hamlet* and even a Klingon Language Institute.

Windsor, a PhD candidate in the School of Languages, Linguistics, Literatures & Cultures, started studying the language four years ago and has presented on Klingon linguistics at the Calgary Comic and Entertainment Expo.

"I don't think anyone expected (Klingon) to take off," says Windsor. "(Stories) become more believable when you get the aliens speaking their own language."

Windsor was quick to offer his Klingon-language services to Telus Spark for its new *Star Trek: The Starfleet Academy Experience* exhibition and hopes to help out with promotions for the event. He didn't wait long to visit after it opened in February.

"We had so much fun," he says. "It's really interactive — you get to try your luck shooting phasers and scanning Klingons with a tricorder." The exhibit also includes props and costumes from the

franchise, as well as models used for filming.

Windsor's Klingon expertise will also come in handy when UCalgary hosts the Language Creation Conference on July 22 and 23.

"We'll be looking at what does studying an artificial language teach us about the learning process and learning biases in natural languages," says Windsor, who is a local co-host of the event dedicated to "conlanging" — the craft of language creation. "It's the first time the conference has been held in Canada."

Klingon is an example of conlanging. The concept is not new, Windsor says; the idea goes back to the 12th century, Esperanto being a famous "real-world" example, and other constructed languages such as Dothraki from *Game of Thrones* have taken on lives of their own.

But Windsor's love for language includes more-traditional ones, too. "I tried to teach myself German when I was seven or nine years old," he says. "I've always been a language nerd." He completed undergrad degrees in English and Gaelic at St. Francis Xavier before coming to UCalgary in 2008 for his master's and PhD. Aside from Klingon, Windsor's interests include Irish and Blackfoot, and his postdoctoral proposal is a study of the Métis language, Michif.

As for his choice to call UCalgary home, Windsor says, "The University of Calgary motto is in Gaelic, so I figured this was the place to be!"

Star Trek: The Starfleet Academy Experience runs to June 4. For more information on the Language Creation Conference, visit conlang.org/language-creation-conference. — Alex Frazer-Harrison **U**

Arsheen Dhalla, BN'10, received the Alumni Achievement Award at the 2016 Arch Awards for her nursing expertise. Six years post-graduation, she has already made her mark internationally. She founded Daraja — which means "bridge" in Swahili — a non-profit foundation and charity in Zanzibar, Tanzania, that supports a local school and orphanage to empower young adults with educational opportunities and provide tools to support life skills.

Omar Eleryan, BSc (Eng)'10, a Calgary engineer, and his business partner, Simon Czarnota, debuted Cleo, their pocket drone, at the international Consumer Electronics Show in Las Vegas in January. The camera drone is small enough to fit into your pocket and is controlled by your smartphone.

Faye Stenning, BKin'12, a professional Spartan racer who nabbed third in the 2016 world championships, was named one of the *Calgary Herald's* 20 "Compelling Calgarians" to watch in 2017. She shares this piece of wisdom: "Don't be afraid to do what you love and take some risks. Never let the thought of failure hold you back."

Erica Wiebe, BKin'12, BA'16, the professional wrestler who brought home a gold medal from the Rio Olympics, has been named one of the *Calgary Herald's* 20 "Compelling Calgarians" to watch in 2017. Her life motto: "Be yourself . . . it will always be enough." She was also named Ottawa's 2016 female athlete of the year at the Ottawa Sports Awards, the largest and longest recurring municipal amateur sport-recognition program in Canada.

Hayley Wickenheiser, BKin'13, MSc'16, retired from hockey on Jan. 13, 2017. The four-time Canadian Olympic gold medallist, considered the best female hockey player in the world, tweeted the announcement: "Dear Canada. It has been the great honour of my life to play for you. Time to hang 'em up!! Thank you!"

Colton Lewis, BComm'15, was named one of the *Calgary Herald's* "Compelling Calgarians" to watch in 2017. He is the key figure behind initiating the Brett Wiese Memorial Scholarship Fund. Wiese was a close friend of Lewis's who was killed at a house party three years ago. This recent grad is optimistic about 2017. Lewis says: "It's going to be an amazing year for Calgarians — actually for all Canadians as we celebrate our 150th birthday. I think we

should acknowledge how fortunate we are to live and study in such an amazing country."

Greg McMeekin, LLB'15, was included on the list of 20 "Compelling Calgarians" to watch for in 2017 by the *Calgary Herald*. He doesn't want to be known as a role model due to his disability (the 43-year-old lawyer has cerebral palsy). Having fought institutional barriers his entire life, his No. 1 passion has never wavered. "I want to help as many people as possible," says the volunteer at Calgary Legal Guidance, whose life motto is, "to try and see the good in all people."

James Thorogood, BSc (Eng)'16, was recently one of 11 Canadians to win a Rhodes Scholarship at the University of Oxford. In the past few years, he has worked with Engineers Without Borders in Ghana to identify viable businesses that could reduce import dependencies and create opportunities for rural communities. He also co-founded Skill2Scale, a social enterprise that develops digital-education services for low-income youth in India and East Africa. Currently, Thorogood is working with a startup enterprise in Kenya to improve the livelihood of millions of small-dairy farmers who are entrenched in cycles of poverty. — Ellis Choe **U**

Events



1

2



3



4

Out & About

Aiming to deepen relationships with alumni in key areas around the globe is what prompts UCalgary Alumni to host various events that honour our successful grads. Whether they are recent alumni who attend a Learn, Laugh, Lead program or graduates in far-flung places who come out for an Idea Exchange event, we want to thank you for taking the time. And remember, Alumni Weekend runs from Sept. 22-24 this year. Hope to see you there!



5

1. IDEA EXCHANGE, NEW YORK

(R): Evelyn Bailey, BComm'88, VP North America Systems (IBM) reunites with Kaenan Hertz, BSc'87, managing partner, Insurtech Advisors. The two went to high school and UCalgary together and hadn't seen one another in years.

2. IDEA EXCHANGE, WASHINGTON, D.C.

(L-R): Justin Meyers, BA'06; Brendan Foht, BA'08; and Bruce Leighton, BA'77, attend a UCalgary breakfast at the Embassy of Canada in Washington, D.C., where Jack Mintz, President's Fellow, School of Public Policy, led a lively discussion.

3. LEARN, LAUGH, LEAD

(R): Haskayne alumna Lara Pearl Ahmed, BComm'15, meets a fellow volunteer.

4. UCALGARY ALUMNI ASSOCIATION 2016 ARCH AWARDS GALA

Medicine Alumna of Distinction Award-winner Dr. Pam Veale, MD'93, MDSc'00, mingles during the pre-gala mixer.

5. IDEA EXCHANGE, TORONTO

(L-R): Alumni Alan Chan, MBA'91; Derek Besant, BFA'73; Diana Nada, PhD'14; Lamis Haggag, MFA'13, at Toronto's Idea Exchange where Besant was the keynote speaker.



Photo courtesy *The Walrus*

6. IDEA EXCHANGE, HONG KONG

(L-R): Wai-Ming But, BSc'80, and ZhiZhao George Liu, PhD'04, celebrate UCalgary's 50th anniversary at the Chinese University of Hong Kong where Joseph Sung, PhD'92, spoke.

7. IDEA EXCHANGE, SAN FRANCISCO

Alumni's first "house party" in San Francisco was hosted by Arthur Wong, BComm'91, and Anne Wong, BA'89, BComm'91. (L-R): William Rosehart, Dean of SSE; Laura Buhler, BComm'09, executive director of C100; Robert Harvey, MSc'98, Onboard SW lead at Planet Labs; Alina Kunitskaya, student intern with BioMarin.

8. IDEA EXCHANGE, OTTAWA

Prof. Steven Bryant (Schulich School of Engineering) speaks to an audience of alumni about the future of clean and sustainable energy.

9. PRIME MINISTER JUSTIN TRUDEAU ON CAMPUS

Prime Minister Justin Trudeau meets staff and volunteers after holding a town hall at the Jack Simpson Gym.

10. IDEA EXCHANGE, NEW YORK

Carol Yan, BComm'13, and Stephanie Stobart join other alumni, students, donors and friends in Manhattan where the psychology of leadership was discussed.

11. UCALGARY ALUMNI SKATE WITH SANTA

On Dec. 5, Santa Claus made his annual appearance on ice at the Olympic Oval.

12. IDEA EXCHANGE, HOUSTON

At Houston's Petroleum Club, Mary Griffin, wife of alumnus Robert Wichert, BSc (Eng)'83, enjoyed a vigorous discussion on clean energy led by Prof. Steven Bryant.

13. WALRUS TALKS

As part of UCalgary's 50th Anniversary celebrations, the university partnered with The Walrus Foundation to present a Walrus Talk. (L-R): Prof. Brittany Harker Martin, PhD'12; Chima Nkemdirim; UCalgary President Elizabeth Cannon, BSc'84, MSc'87, PhD'91; Mark Hopkins, BA'05; Mayor Naheed Nenshi, BComm'93; Lauren Voisin (front); Aaron Park, BSc'07, BEd'11; Zahra Al-Harazi; Eric Termuende, BComm'14; Manjit Minhas; Nadia Fatah; and *Walrus* magazine publisher Shelley Ambrose. **U**

Get Your Game On



Ready for a challenge? Put pen to paper and try your hand at these two UCalgary games of trivia. Match notable alumni with their job titles and then, when you have that nailed, test your know-how with our first-ever crossword puzzle.

After that, scan your entry and email it to us; you could win a \$70 gift certificate to UCalgary's bookstore (where they sell more puzzlers!) as well as art supplies, clothes, mugs, water bottles, magazines and books, of course, lots and lots of books.

(Note: There are major crossword spoilers on our magazine website. We hope you won't "cheat" but, if you do, we'll be here when you get back.)

Scan both completed puzzles and email to: alumni@ucalgarymag.ca

Alumni Match-up

- | | | |
|------------------------|-----------------------|--|
| Rebecca Northan | <input type="radio"/> | Served four terms as mayor of Calgary |
| Ashton Embry | <input type="radio"/> | Former program aid for Clark, former executive aid for Harper |
| Eric Greif | <input type="radio"/> | Won Olympic gold and is a gay rights activist |
| Robert Thirsk | <input type="radio"/> | Has a fossil named after him |
| Sue Pedersen | <input type="radio"/> | Conservationist/writer honoured by Time magazine |
| Drew Scott | <input type="radio"/> | Canadian improviser, theatre director |
| Naheed Nenshi | <input type="radio"/> | Legendary UCalgary basketballer and a Rhodes Scholar |
| Jim Hawkes | <input type="radio"/> | Award-winning writer of children's books |
| Jodi Evans | <input type="radio"/> | Was CEO of the Calgary Stampede |
| Kathleen Ganley | <input type="radio"/> | First Canuck to soar in a Soyuz spacecraft |
| Vern Kimball | <input type="radio"/> | World expert on obesity |
| Al Duerr | <input type="radio"/> | Co-managed Motley Crue |
| Don Gillmor | <input type="radio"/> | First Muslim mayor of a major North American city |
| Mark Tewksbury | <input type="radio"/> | Solicitor General of Alberta |
| Harvey Locke | <input type="radio"/> | He and his twin brother co-host Property Brothers |

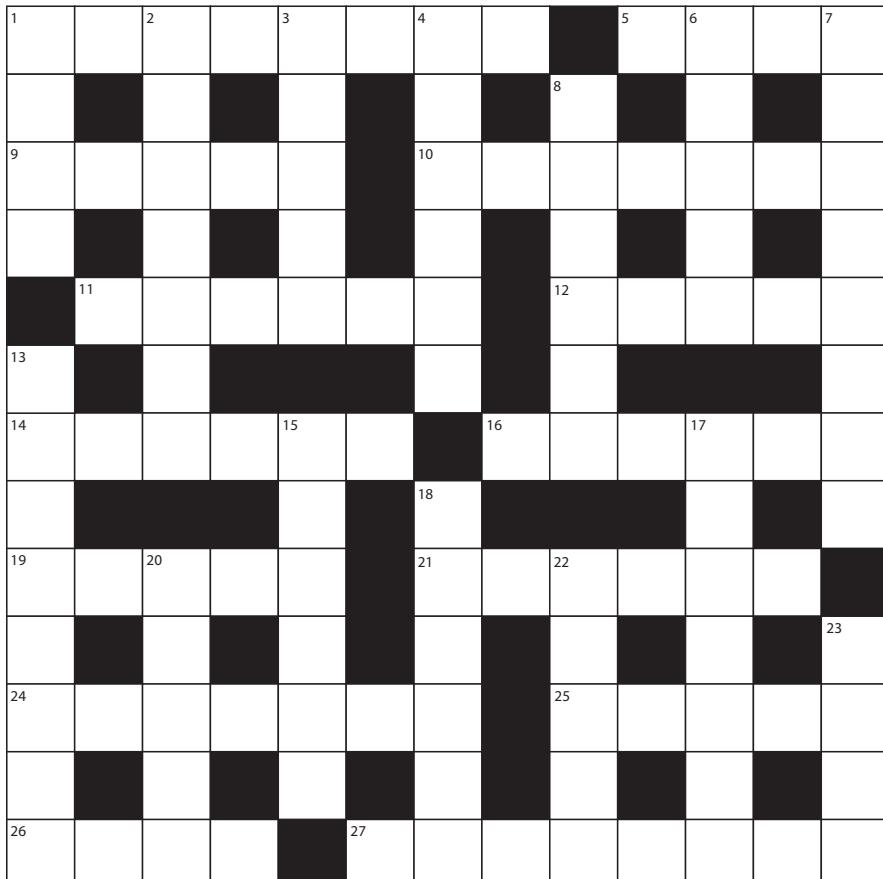
Puzzle Over This — And All That Is UCalgary

ACROSS

- Former Canadian Prime ____ Stephen Harper has strong ties to the University of Calgary (as did Joe Clark's top aide, Jim Hawkes)
- Dennis Wilson of lululemon fame is better known by this nickname
- Development practitioner ____ Smith was honoured by the U of C in 2008
- Dug up, as a geoscientist such as the U of C's Darla Zelenitsky might do
- The U of C is now within the Calgary Confederation ____
- UCalgary's teams go by this nickname
- James Gosling is known as "The ____ of Java"
- Canada's "Motor City"
- At the U of C library, you can even find video games by this early maker
- U of C International offers a course called Environmental and Urban Geography of Alpine ____
- Dr. Mary-Wynne ____ was honoured by the U of C in 2006 for her work on nuclear disarmament
- Early inhabitant of Grenada, where the U of C's Sir Carlyle Glean was governor general
- ____ Kirker is a past president of the Law Society of Alberta
- Olympic gold medallist Erica Wiebe is one

DOWN

- The U of C has a Scribe and ____ English Club (SMEC)
- Christine ____ won gold in speed skating at the 2010 Olympics in Vancouver
- The largest denomination of Islam
- The U of C's John Zaozirny was Minister of ____ for Alberta, a post later held by Murray Smith
- Irfan Sabir is now our Minister of ____ Services
- Exalt or praise highly, put on a ____
- The U of C has boasted a number of ____ Scholars, most recently Bogdan Knezevic
- The Order ____ has been bestowed on a number of U of C educators and alumni, including astronaut Bob Thirsk
- Deb Cummings is our Alumni Publications ____
- lululemon bills itself as a "yoga-inspired athletic ____ company"
- Green Party ____ Janet Keeping attended U of C
- Pale, like Calgarians in winter?
- The Dino Dash offers both 5 and 10 km ____
- Billionaire Garrett Camp co-founded ____



Puzzles by Larry Humber



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