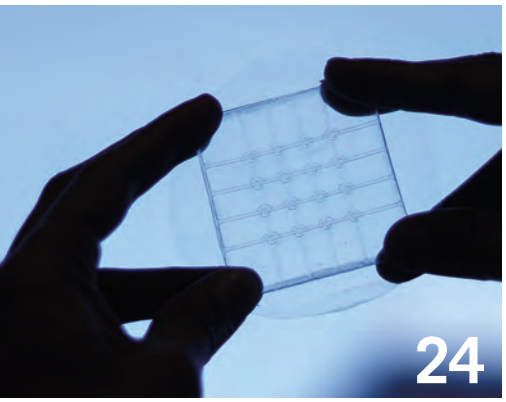
FACULTY OF APPLIED SCIENCE | ISSUE 37 | WINTER 2018

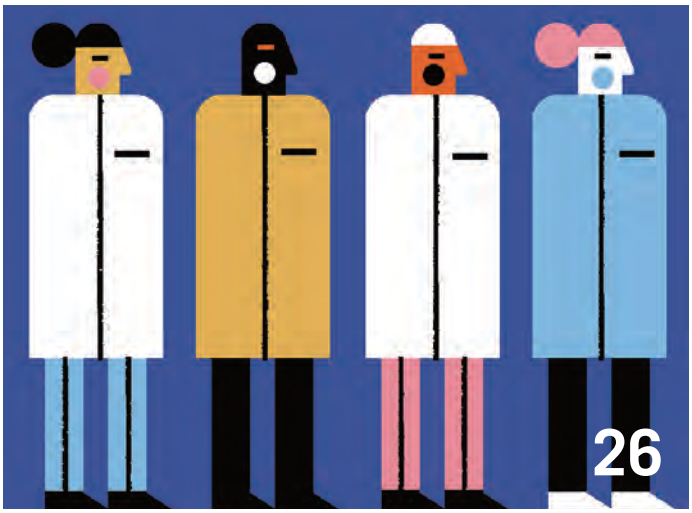
INGENUITY

WHAT WILL TOMORROW BRING?

THE UNIVERSITY OF BRITISH COLUMBIA
Faculty of Applied Science

ISSUE 37





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ON THE COVER

The Next 100 Years of Applied Science: Feature on page 26. Illustration by Raymond Biesinger.

INGENUITY

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Pulp and Paper Centre (PPC)
(Research on Active Transportation (REACT)
Stigma and Resilience Among Vulnerable Youth Centre (SARAVYC)
Water Planning Lab

Dean's Message

What do nurses, architects, planners and engineers have in common? On the surface, maybe not that much. Most nurses don't design buildings, for example, and architects usually don't treat patients. But if one looks a little deeper, at least one major commonality becomes apparent: they all use science and design thinking to improve our daily lives. Providing clean water to rural communities, developing smarter, more sustainable cities and increasing resilience and health equity among vulnerable populations are just a few of the goals that UBC applied scientists are advancing every day.

Working with APSC students, faculty members and alumni, I am continually struck anew by their ingenuity, passion and entrepreneurial spirit. Although 2017 was a year of significant change — among other developments, Dean Marc Parlange and Associate Dean Elizabeth Croft took their formidable talents overseas, and we gained a new School of Biomedical Engineering (led by renowned researcher Dr. Peter Zandstra) that will offer an undergraduate degree program in the subject — I believe one feature of the Faculty will always remain the same: its extraordinary people, whose integrity, intelligence, collegiality and shared sense of purpose are second to none.

In the pages that follow, you will find stories about the work of several outstanding members of the APSC community — work that builds on a deep foundation of knowledge and support laid over the past 100-plus years. From uniquely impactful research initiatives and triumphant student clubs to innovative educational and entrepreneurial endeavours, the groups highlighted in this issue will themselves educate, engage and otherwise inspire students and colleagues long into the future.

Speaking of the future, this edition of *Ingenuity* explores some forward-looking questions: Can the Cascadia region become the next major tech innovation hub? And where might the applied sciences take us over the next 100 years? In another article, valuable insights into the important, complex subject of BC treaty negotiations are offered by two experts affiliated with Indigenous Community Planning, a pioneering master's degree program offered by the School of Community and Regional Planning. We also meet some recent additions to the APSC faculty and say goodbye to dear, departed friends.

Global health, artificial intelligence, clean energy and bioproducts, social justice — these are some of the crucial areas in which APSC members are making tremendous progress. But of course we are not doing it alone. It is only by forming meaningful connections with institutions, companies, communities and individuals like you that we've been able to accomplish the things we have. We are deeply grateful for your continued generous support for the work that we do, and welcome new and inspiring connections.

Best regards,

James Olson, PEng, PhD, FCAE
Dean Pro Tem, UBC Faculty of Applied Science

To view past issues of Ingenuity, *visit apsc.ubc.ca/publications.*

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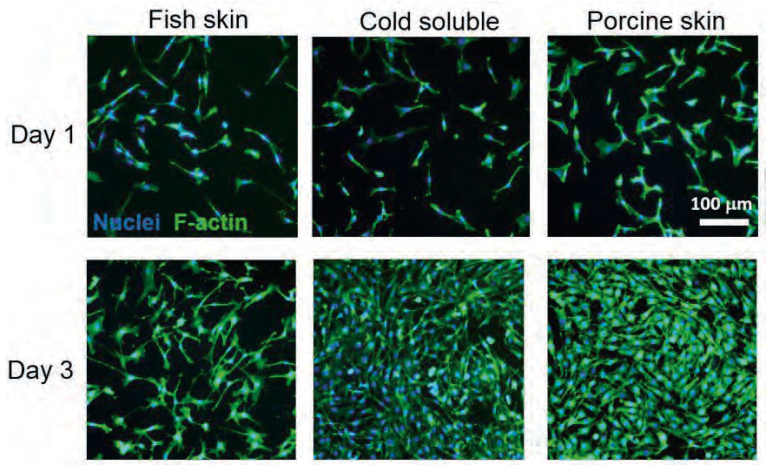


Cell adhesion and proliferation in 2D cultures with GelMA hydrogels from different sources

A BETTER, CHEAPER BIOINK FOR BIOFABRICATION

A new bioink that may enable the more efficient and inexpensive fabrication of tissues and organs — and ultimately accelerate advances in regenerative medicine — has been synthesized by researchers at UBC's Okanagan campus.

To create biologically functional products in the lab, the researchers combine living cells, bioactive molecules and biomaterials into organized structures. One such biomaterial is gelatin methacrylate (GelMA), a chemically modified hydrogel that serves as a bioink and building block in bioprinting and bioassembly processes.

Read more at apsc.ubc.ca/research/better-cheaper-bioink

3D-PRINTED BONES

A UBC Okanagan researcher has discovered a new artificial bone design that can be customized and made with a 3D printer for stronger, safer and more effective bone replacements.

Hossein Montazerian, research assistant with UBC Okanagan's School of Engineering, has identified a way to model and create artificial bone grafts that can be custom printed. Montazerian says human bones are incredibly resilient, but when things go wrong, replacing them can be a painful process, requiring multiple surgeries.

Read more at apsc.ubc.ca/news

CONGRATULATIONS TO CAE WINNERS

In June, 2017, four UBC professors — Perry Adebar, PEng (CIVL), Choon (Jim) Lim, PEng (CHBE), James Olson, PEng (MECH) and Marc Parlange, PEng (CIVL) — were inducted as fellows of the Canadian Academy of Engineering (CAE) in recognition of their "distinguished achievements and career-long service to the engineering profession."

SUSTAINABLE URBANIZATION AT THE GLOBAL LEVEL

In October 2016, students from the School of Community and Regional Planning (SCARP) travelled to Ecuador to represent Canada as part of the official delegation to Quito for Habitat III, the United Nations Conference on Housing and Sustainable Urban Development. Fifteen SCARP students participated in the conference, alongside fifty thousand other delegates and participants from around the globe.

Through the New Urban Agenda — a new framework that that lays out how cities should be planned and managed to best promote sustainable urbanization — Habitat III brought together mayors, local and regional authorities, civil society and community groups, the private sector and urban planners to analyze and discuss challenges.

3 TIPS FOR UNDERGRADUATE NURSES

What are the top three things current Chair of the UBC Alumni Association Board of Directors Faye Wightman (BSN '81) would recommend current nursing students do before they graduate?

1. Get as much real life experience as possible in a health care experience — even if that means volunteering — it gives a true picture of what life will be like.
2. Explore a different culture than the one you were brought up in — gives you a different experience through someone else's eyes.
3. Consider what you like best about nursing — and then sit down with a few other people who got their nursing degree but aren't necessarily using the degree working in health care. I believe a nursing background prepares you for many jobs — so explore your options.

Read more at apsc.ubc.ca/spotlight/alumni/faye-wightman

TOUCHPOINTS

Get caught up with the latest news from UBC Nursing with the fall/winter Touchpoints magazine — available online at nursing.ubc.ca/newsletters.

APPLIED SCIENCE RISING STARS | Each spring, Applied Science recognizes exceptional graduating students from across the Faculty. These students have overcome amazing odds, made significant impacts on the lives of others, achieved excellence in their studies and invented life-changing technologies.

To read their stories, visit apsc.ubc.ca/students/stars/2017

THE NEW SCHOOL OF BIOMEDICAL ENGINEERING | The Faculties of Applied Science and Medicine have announced the joint establishment of the School of Biomedical Engineering (BME) at UBC, effective July 1, 2017.

The School of Biomedical Engineering will serve as an innovation hub for education and research across both Faculties, working with industry and our health partners, to accelerate discoveries and improve health outcomes here in BC and around the world.

The school will be the new home of UBC's current graduate BME programs, which will welcome its seventh cohort this fall. An initial complement of faculty members and staff will support the new school, which will also house the Biomedical Research Centre.

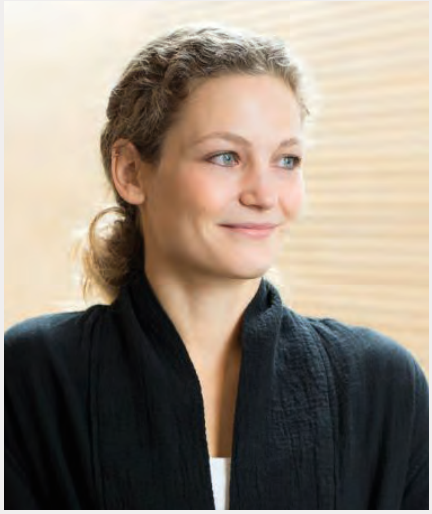
To lead this new collaborative initiative, Professor Peter Zandstra has been appointed as founding director.

In fall 2018, the school will introduce a new undergraduate program in biomedical engineering. Led by program director Peter Cripton, students will gain the fundamental knowledge, critical thinking tools and practical skills needed to support the growing needs of the life science and medical device industry in BC and Canada.

TREES CAN MAKE OR BREAK CITY WEATHER | Even a single urban tree can help moderate wind speeds and keep pedestrians comfortable as they walk down the street, according to a new study by former UBC Civil Engineering postdoctoral fellow Marco Giometto. The study also found that losing a single tree can increase wind pressure on nearby buildings and drive up heating costs.

The researchers used remote-sensing laser technology to create a highly detailed computer model of a Vancouver neighbourhood down to every tree, plant and building. They then used computer simulation to determine how different scenarios — no trees, bare trees and trees in full leaf — affect airflow and heat patterns around individual streets and houses.

"We found that removing all trees can increase wind speed by a factor of two, which would make a noticeable difference to someone walking down the street," said Giometto.



MEL GRAD RECEIVES ENVIRONMENTAL AWARD | Master of Engineering Leadership (MEL) graduate Alice Kruchten (BASc '11 CIVL, MEL '17 IWM) has received the Emerging Environmental Professional Award from the Environmental Managers Association of BC, for her "professional achievement, innovation, experience and leadership, along with community involvement."

In 2016, Kruchten took a one-year leave of absence from her job at Keystone Environmental (a local environmental consulting company) and enrolled in UBC's MEL program in Integrated Water Management, which covers a broad range of topics that are directly relevant to her work: not only technical subjects like biological wastewater treatment and engineering design, but also strategy and innovation, project management and client interaction.

"The MEL program gave me the skills and confidence to pursue more leadership roles and opportunities," says Kruchten. "I also made lasting connections with my classmates — bright people from varied backgrounds who will go on to be engineering leaders in their fields."

NEW FACULTY

MATTIA BACCA

ASSISTANT PROFESSOR, DEPARTMENT OF MECHANICAL ENGINEERING

WHY ENGINEERING?

I have always been fascinated by mechanisms. I guess also the fact that I played with LEGO more than any other kid I knew played a role.

WHAT ARE YOUR RESEARCH INTERESTS?

My current research focus is on the mechanics of bio-inspired materials. In particular, contact mechanics applied to the design of gecko-inspired dry adhesive materials.

DO YOU HAVE A FAVOURITE ITEM YOU COULDN'T LIVE WITHOUT?

I couldn't live without Chilled Out at 181.fm, an internet radio station for ambient-pop music.

FIONN BYRNE

ASSISTANT PROFESSOR, SCHOOL OF ARCHITECTURE AND LANDSCAPE ARCHITECTURE

WHY LANDSCAPE ARCHITECTURE?

My grandfather taught me the importance of accuracy and precision made possible with patience. My grandmother taught me to appreciate all creatures and to know the world from a point of view outside myself. My father taught me to enjoy nature from a canoe and a camp site and my mother taught me composition and trained my eye to design.

WHY UBC?

The city and campus are quite beautiful. The faculty in landscape are very strong, and across the university there is a lot of very interesting work happening. I am quite excited to make some connections and build relationships.

HOW DO YOU HOPE YOUR WORK WILL IMPACT STUDENTS?

Teaching is my passion. I try to teach students to challenge their own beliefs, to get into the habit of being their own hardest critic such that they can feel most confident in defending their ideas and opinions. If students can articulate not what they want to do, but why they want to do it, I feel that I have been successful.

ERNEST GOH

INSTRUCTOR, SCHOOL OF ENGINEERING

WHAT ARE YOUR RESEARCH INTERESTS?

Building an enclosed narrow-track electric vehicle. I have recently secured the donation of a tilting three-wheel motorcycle frame and, together with another instructor, have two capstone project teams working on it. One team is responsible for the enclosure and mechanical subsystems, while the other is responsible for the heating, ventilation and air conditioning.

HOW DO YOU HOPE YOUR WORK WILL IMPACT SOCIETY?

Using a three-wheel tilting motorcycle as a base vehicle offers many advantages. First, with tandem seating — one seat behind the other — the vehicle is long and slender, resulting in very low drag. Second, the frontal area of tandem seating is half (or less than half) that of a standard compact commuter car, reducing drag even further.

This low drag reduces the battery capacity required to achieve a useful vehicle range. This means that charging times are reasonable even when a domestic electrical outlet is used, eliminating the need for a specialized charging infrastructure — a frequent barrier to the widespread adoption of electric vehicles.

We estimate that the fuel economy will be 0.72 litres of equivalent electricity per 100 km (Le/100km), or 326 mpg. I feel that is a solution that is good for the environment, the city planners, taxpayers and the family budget.

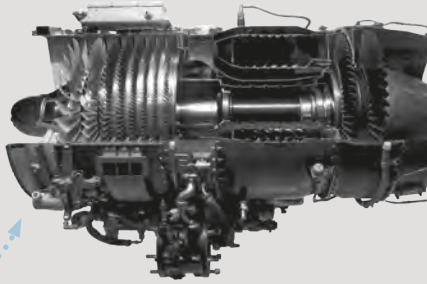
SINA KHEIRKHAH

ASSISTANT PROFESSOR,
SCHOOL OF ENGINEERING

WHY ENGINEERING?
Engineering allows me to think about real problems, and most importantly, combine my mathematics and physics knowledge to solve them.

HOW DO YOU HOPE YOUR WORK WILL IMPACT SOCIETY/ STUDENTS?
Combustion of fossil fuel accounts for about 85 per cent of total energy production in the world, and this number will remain large in the foreseeable future. Unfortunately, combustion can be associated with pollutant formation and consumption of fossil fuel, which is a limited resource. My research program has long- and short-term impacts. On a long-term basis, the program will allow for decreasing pollutant formation and emissions, as well as designing improved combustors that allow for operation with sustainable fuel sources. On a short-term basis, my program helps decrease development cost of gas turbine engine combustors, which is currently about one billion USD.

"We utilize state-of-the-art measurement techniques in order to probe into the heart of gas turbine engines, diagnose problems, understand the causality chain that leads to the occurrence of the problems and, finally, develop technology to prevent them from happening."



XIAOLIANG JIN

ASSISTANT PROFESSOR,
DEPARTMENT OF MECHANICAL ENGINEERING

WHY UBC?
UBC is a one of the world's leading universities, with a beautiful campus, brilliant students and diverse culture. The good memories of my six years at UBC during my PhD and postdoctoral period drove me back.

WHAT ARE YOUR RESEARCH INTERESTS AND CURRENT PROJECTS?
My research interests are the surface generation in precision manufacturing processes. My current projects include the surface texturing to enhance tribological properties, vibration assisted machining of brittle materials and micro machining of high-strength aerospace alloys.

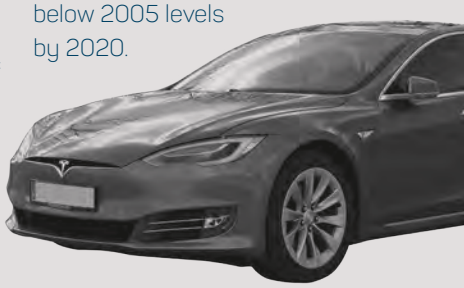
HOW DO YOU HOPE YOUR WORK WILL IMPACT SOCIETY/ STUDENTS?
I hope my work will extend the existing knowledge base related to manufacturing, and result in a more efficient production process with higher product quality. It is expected that my work will provide students with scientific understanding of the manufacturing process and benefit their future careers as manufacturing engineers.

JIAN LIU

ASSISTANT PROFESSOR,
DEPARTMENT OF MECHANICAL ENGINEERING

WHAT ARE YOUR RESEARCH INTERESTS?
I'm currently focused on identifying and developing new meso/nano-scale materials for next-generation battery technologies and better understanding synthesis-structure-performance relationships in energy materials.

HOW DO YOU HOPE YOUR WORK WILL IMPACT SOCIETY?
New battery technologies will play a crucial role in future energy systems … . The development of next-generation battery technologies in my research program will accelerate the deployment of electric vehicles, increase the adoption of renewable energy technologies, address the energy crisis and environmental consequences because of fossil fuels, and contribute to the achievement of the Government of Canada's target to reduce greenhouse gas emissions by 30 per cent below 2005 levels by 2020.



NEW FACULTY

MAURICIO PONGA

ASSISTANT PROFESSOR, DEPARTMENT OF MECHANICAL ENGINEERING

WHAT IS YOUR EDUCATIONAL BACKGROUND?

I have a degree in aeronautical engineering from the University of La Plata in Argentina and an MSc and a PhD from the University of Seville in Spain. I was also a postdoctoral scholar at the California Institute of Technology under the supervision of Kaushik Bhattacharya and Michael Ortiz.

WHY ENGINEERING?

When I was a kid, I was curious about airplanes. I wanted to understand how something so big and heavy could fly. As I was growing up, I also developed a passion for physics and mathematics, so I decided to study aeronautics.

WHAT ARE YOUR RESEARCH INTERESTS/ CURRENT PROJECTS?

I would like to better understand materials. To do this, I use a variety of research methods, from quantum mechanics simulations to continuum models with finite elements. My research is at the intersection of mechanical engineering, mechanics of materials, and computer science, focusing on multiscale modeling of materials, modeling and simulation, and method development.

JULIA RUBIN

ASSISTANT PROFESSOR, DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING

WHY ENGINEERING? DID A PARTICULAR PERSON OR EVENT INSPIRE YOU?

My mom was an engineer and a software developer. Since I was five years old, I knew that is exactly what I wanted to do when I grew up. I was always intrigued by these mysterious machines called computers and wanted to figure out how exactly they work.

WHAT ARE YOUR RESEARCH INTERESTS/CURRENT PROJECTS?

I work on topics related to software security, reliability and sustainability. More specifically, my current research focuses on two main areas: one is about security, privacy and energy-efficiency in mobile software, and another is about secure and reliable composition of software components and cloud-based microservices.

HOW DO YOU HOPE YOUR WORK WILL IMPACT SOCIETY?

Today, all aspects of our daily lives rely on software. Building software we can trust will improve our quality of life and well-being. Putting my research work aside, I am also committed to educate the next generation of researchers and engineers so they can build a better future for all of us.

ADAM RYSANEK

ASSISTANT PROFESSOR, SCHOOL OF ARCHITECTURE AND LANDSCAPE ARCHITECTURE

WHAT IS YOUR EDUCATIONAL AND PROFESSIONAL BACKGROUND?

I am an engineer by training, but maybe one of non-typical professional inclinations. [He completed his BASc, MScE and PhD in engineering.] I then moved on to become a senior researcher at the Institute of Technology in Architecture and Future Cities Laboratory of ETH Zurich, managing the 3for2 Beyond Efficiency building design project in Singapore between 2014 and 2017.

WHY ENGINEERING/ARCHITECTURE? DID A PARTICULAR PERSON OR EVENT INSPIRE YOU?

For as long as I can remember, I've had an interest in science and design and an inquisitive nature to go with it. In fact, I really can't remember a time in my youth when I wasn't somehow fixated on questioning everything, tinkering and trying to make things around me look better and be more useful. I always wanted to grow up to design, build and fly aircraft. This ambition actually led me to study engineering in the first place, and it took me all the way to working for Airbus in Hamburg, Germany during a gap year I took in 2004. This experience living in Germany turned out to be pivotal for me though, as it reshaped my career interests in a completely new direction.

JONATHAN VERRETT

INSTRUCTOR,
DEPARTMENT OF CHEMICAL
AND BIOLOGICAL ENGINEERING

RESEARCH FOCUS:
My teaching interests include peer-learning, leadership development and open educational resources. I aim to facilitate classroom environments where students are developing their knowledge and skills through interactions with peers and the instructor.

I am also very interested in supporting student-led projects that develop leadership both inside and outside of the curriculum including design teams, research and entrepreneurship.

My technical background has touched on a variety of energy-related fields including gas hydrates, photocatalysis and biohydrogen production.

ACCOLADES:
I have been recognized for my role in innovative teaching and emphasis on student interaction in the classroom. I have collaborated with colleagues from Japan and France, as well as supervised exchange students from these countries. My technical work has been featured in journals such as *Chemical Engineering Science* and *Fluid Phase Equilibria*.

SABINE WEYAND

INSTRUCTOR,
SCHOOL OF ENGINEERING

WHAT ARE YOU WORKING ON RIGHT NOW?
Along with fellow faculty members Dr. Labun and Dr. Eikenaar, I organized the first annual campus-wide, multi-disciplinary Teaching Design Showcase, showcasing interdisciplinary teaching and evaluation in the undergraduate classroom.

I am also actively encouraging engineering students to have a more entrepreneurial mindset both inside and outside the classroom. I am working on a new blended learning module that will provide students from a variety of disciplines with the opportunity to obtain certificates (badges) in design thinking, design prototyping and manufacturing, and entrepreneurship.

I am also engaged with GoEng Girl, Women in Science and Engineering, and local science fairs to recruit more women into engineering.

goENG GIRL
GÉNIales, les filles

DAVID ZIELNICKI

INSTRUCTOR,
SCHOOL OF ENGINEERING

WHAT INSPIRED YOU TO PURSUE A CAREER IN LANDSCAPE ARCHITECTURE?
I grew up in the Chicago area. My senior year of high school, our humanities teacher assigned us *Devil in the White City* by Erik Larson. The descriptions of designing and directing the construction of the fairgrounds and the exposition structures fascinated me. The impact of the book was doubled by my close proximity and familiarity with the remnants of the World's Columbian Exposition still in Chicago. After reading the book, I looked more into the life and work of Olmsted — I had no idea landscape architecture was a profession, but it seemed exciting. I switched from applying to graphic design and industrial design programs to applying for landscape architecture.

WHY UBC?
UBC's landscape architecture program is exceptional. The program gains a practical grounding in the large research institution from its historic roots in the Faculty of Agricultural Sciences. Its current position in the collaborative School of Architecture and Landscape Architecture demonstrates the program's contemporary interest in interdisciplinary work and design-forward exploration.

Find out more at apsc.ubc.ca/new-faculty

THE DAWN OF THE LEARNING FACTORY

If medicine has teaching hospitals, why does engineering not have learning factories — where production, research and education come together seamlessly?

Building on the success of introducing simulation to composites manufacturing to reduce risk, cost and time, UBC is developing — in conjunction with the Composites Research Network and its industrial partners — an exciting new initiative to reimagine composites manufacturing for the 21st century, bringing together simulation, sensors and data analytics, and automation.

The physical factory will have a core capability which is the current, qualified production baseline. The factory will be immensely data rich, with multiple layers of sensors and data analysis. It will be sized to allow for both standard production and research production. It will be highly reconfigurable and multi-layered in its ability to allow different sensor and data analysis technologies to be implemented and researched. There will be a digital twin in the cloud, where a virtual factory based on simulation will be used, in combination with the rich data from the physical factory, to understand, manage and improve advanced composites manufacturing processes.

The factory will be physically designed to be a mixed-use facility, satisfying both academic and industrial requirements. It will be part of the UBC Okanagan campus, a key tenant of the new Innovation Precinct and will be conducive for interaction and collaboration. Equal attention is being paid to the virtual factory, which will be hosted at the UBC Vancouver campus, where the combination of big sensor and data capacity from the physical factory will be combined with simulation to understand, control and optimize the production of advanced aerospace composites structures.

For further information visit ubcinnovationprecinct.ca and crn.ubc.ca.

UBC School of Engineering Associate Professor Lukas Bichler founded the metalcasting laboratory for advancement of magnesium and aluminum alloys, which researches the characterization and modification of materials and their properties via advanced techniques, as well as produces novel grain refiners and in-situ composites for Al and Mg-based alloy systems.

UBC AND KAL TIRE RESEARCH PARTNERSHIP

UBC and Kal Tire's Mining Tire Group have formed a research partnership that will allow the two organizations to collaborate in developing technology and innovative solutions for the mining tire industry.

In the memorandum of understanding, both parties agree to pursue a research and innovation partnership that matches expertise from the UBC School of Engineering in the Okanagan with the innovation goals of Kal Tire's Mining Tire Group.

"We wanted to harness the knowledge and ideas of our team members to advance innovation, and through this partnership with UBC, we now have access to the skills, knowledge and facilities that we didn't have prior," says Dan Allan, senior vice-president, Kal Tire Mining Tire Group. "Research like this fuels the innovation that takes great ideas forward."

The MOU lays out an initial three-year term of collaboration on mutually beneficial areas of research, as well as Kal Tire's significant investment in the partnership. Individual researchers will submit project ideas that include everything from robotics and metallurgical design to environmentally responsible ways to use recycled tire crumb.

"We see this partnership as another key step in our goal of helping to advance economic development opportunities in our region," says Deborah Buszard, deputy vice-chancellor and principal of UBC's Okanagan campus.

FIRCOM: A VAST SANCTUARY IN NATURE

On the eastern shore of Gambier Island, encompassing 120 acres of coastal forest, beach and farmland, is a vast "sanctuary in nature" called Fircom (First Community). Established in 1923 by the First Presbyterian Church and Community Services, it was created to serve as a place of rest and healing for people seeking respite from the grim tenements of Vancouver's Downtown Eastside.

The Task: to revive an overgrown forest clearing in the location of Camp Fircom's original outdoor chapel

Today, Fircom offers summer camps, outdoor schools and learning tours that promote its core values of education, environment, health and wellness, and spirituality. Since 2015, it has also hosted students from the graduate-level Design+Build program at UBC's School of Architecture and Landscape Architecture (SALA), who have helped enhance Fircom's values in their own way — by planning and constructing functional structures for use by Fircom staff, campers and visitors.

To date, these structures include an archery pavilion, an amphitheatre and three off-the-grid cabins (named Salala, Salamander and Salarium). In executing their projects, the students experienced first-hand the challenges and rewards of real-world architectural practice — gaining not only invaluable practical knowledge, but also a greater familiarity with the discipline's environmental,

The Task: to expand facilities for campers and create more opportunities for engagement with the neighbouring community

psychological and even spiritual dimensions in the process.

"Taking part in the program was one of the most valuable experiences of my architectural training," says one of the student participants. "I feel that engaging in the full design-build process so early in my career has made me a more knowledgeable, confident and thoughtful designer."

Though Design+Build is an integral part of SALA's graduate degree curriculum, similar programs are actually a rarity among architecture schools, notes SALA faculty member Greg Johnson, who has overseen the workshop since its inception. Design+Build students devote one school term to design and practical preparations — producing construction documents, sourcing building materials and applying for permits — before heading to Gambier in early summer for the six-week build.

The structures shown on these pages were conceived and constructed entirely by UBC Design+Build students in the spring and summer of 2017, with guidance from Johnson.

For further information visit: blogs.ubc.ca/saladesignbuild/projects.

BETTER NIGHTS, BETTER DAYS

If your child has trouble falling asleep, a new online resource called "Better Nights, Better Days" may soon be here to help. Created by UBC Nursing Professor Wendy Hall and other sleep experts across Canada, and currently being tested in a clinical trial, it aims to give parents greater control over their kids' sleep habits.

As many as one in four Canadian children consistently wake up too early or have difficulty falling or staying asleep. This disorder, known as behavioural insomnia, usually results in sleep issues for the children's parents as well — negatively impacting the whole family's mood, behavior and school or work performance.

Even worse, studies have shown that regularly losing even a small amount of sleep during childhood can result in long-term learning and behavioural challenges. Children who sleep just one hour less than they should for four nights in a row have worse memories, shorter attention spans and a poorer ability to regulate emotions than their better-rested counterparts. They are also more likely to develop Type 2 diabetes.

In light of these dangers, why do only one per cent of insomniac children receive effective treatment? Largely because available behavioural treatments are unknown to many care providers and for the few parents who are aware of them, the treatments are not conveniently accessible. Instead, parents turn to drugs — including over-the-counter sleep aids like melatonin, which have not been tested for safety in long-term studies, and also fail to address the behavioural causes that frequently underlie poor sleep patterns.

So, Hall and her colleagues (psychologists, nurses and physicians among them) set out to develop an accessible tool to help as many sleep-deprived parents and children as possible. The result is Better Nights, Better Days — a web-based intervention that educates parents about the science of sleep problems and offers detailed advice and strategies, based on behavioural principles and clinical best practices, to promote healthy sleep habits in typically developing children aged one to 10.

"By giving parents the ability to manage their children's nighttime sleep behaviour, Better Nights, Better Days has the potential to have a dramatic positive impact on the wellbeing — physical, psychological and emotional — of children and adults alike," says Hall.

THE PROGRAM

Session 1 – Sleep information:
What is sleep? How do sleep problems develop?

Session 2 – Healthy sleep practices:
What can I do during the day to help my child sleep at night?

Session 3 – Settling to sleep:
How can I teach my child to fall asleep independently?

Session 4 – Going back to sleep:
How can I help my child fall back asleep after waking at night or waking up too early?

Session 5 – Looking back and ahead:
Course review, plan for the future.

Right: Professor Wendy Hall explaining the online program Better Nights, Better Days.

Takeaways

Set a bedtime and stick to it. *Ensure that your child goes to bed at the same time — or no more than 30 minutes before or after the set time — every night.*

Establish a "wind down" routine. *As bedtime approaches, dim the lights, remove all electronic devices and otherwise create a quiet, calm environment in preparation for sleep.*

Don't respond to fussing or crying right away. *This will only reinforce your child's crying and interfere with their ability to learn how to self-soothe. Instead, attend to your child on a set schedule.*

Encourage physical activity, as well as exposure to fresh air and natural light, during the day. *Doing so will help maintain healthy circadian rhythms.*

Address your child's sleep problems as early as possible. *If the problems occur at least three times a week for three months or more, consider consulting your primary care provider.*

UBC ROCKET

In its first year of existence, UBC Rocket grew from two to more than 100 members, designed and built a suborbital spacecraft, and outflew MIT to win the most competitive category in the 2017 Spaceport America Cup in New Mexico (rockets launched to an altitude of 10,000 feet using a commercial off-the-shelf motor).

As with many success stories, passion and hard work lie at the heart of the amateur rocketry team's early triumphs. In recruiting its members, founders and engineering students Simon Bambey and Joren Jackson focused more on the applicants' level of interest and commitment than their depth of experience — and it clearly paid off.

Today, UBC Rocket is designing an in-house propulsion system and eagerly preparing for next year's competition, where they plan to participate in both the 10,000- and 30,000-ft categories. Here is a closer look at Cypress, the team's winning rocket, which was lovingly named after the West Vancouver provincial park.

UBC Rocket: Cypress

1. NOSE CONE
LD Haack profile 3D printed from ABS plastic

2. TRACKING ELECTRONICS
Contains a GPS beacon and ground relay to aid in recovery

3. MADS PAYLOAD
Houses GPS tracking electronics and payload parachutes for safe recovery

4. EMECS PAYLOAD
Uses sensor data and a non newtonian fluid to mitigate g-force effects from launch

5. OZONE PAYLOAD
Uses atmospheric detection module in order to detect the atmospheric boundary layer

6. AVIONICS BAY
Uses atmospheric pressure sensors and accelerometer data to determine when to release parachutes

7. RING RELEASE
Secures main in place during descent without placing high stress on the linear actuator

8. MAIN PARACHUTE
Nylon construction. Slows descent of rocket to 8m/s. Deployed using a linear actuator

9. DROGUE PARACHUTE
Nylon construction. Aids in deployment of main parachute by taking the brunt of initial stresses experienced

10. ENGINE
Cesaroni solid rocket fuel engine generating 1790 newtons of sustained thrust

11. MOTOR MOUNT
Holds the engine securely in place during flight

12. FINS
Clipped delta design. 3D printed from ABS plastic and wrapped in carbon fibre

13. NOZZLE
Directs and accelerates the hot gases from the engine to produce enough thrust to lift the rocket into the sky

Four members of the UBC Rocket team and Cypress, at the 2017 Spaceport America Cup.

UBC STUDY FINDS OPTIMAL WALKING AND CYCLING SPEEDS TO REDUCE AIR POLLUTION INHALATION

Cyclists should be riding at speeds between 12 and 20 kilometres per hour, while pedestrians should be moving at two to six kilometres per hour on city roads to minimize their inhalation of air pollution while still getting the health benefits of exercise, according to new UBC research.

"The faster you move, the harder you breathe and the more pollution you could potentially inhale, but you also are exposed to traffic for a shorter period of time. This analysis shows where the sweet spot is," said Alex Bigazzi, a UBC transportation expert in the Department of Civil Engineering and School of Community and Regional Planning who conducted this analysis.

Using a US Census-based computer model of 10,000 people, Bigazzi calculated ideal travel speeds that he calls the minimum-dose speeds (MDS) for different age and sex groups. For female cyclists under 20, the ideal speed linked to the least pollution risk is 12.5 kilometres per hour on average on a flat road. For male cyclists in the same age group, it's 13.3 kilometres per hour. Ideal travel speeds were at 13 and 15 kilometres per hour for female and male cyclists in the 20-60 age group.

Female and male pedestrians under 20 years old should be walking at speeds around three kilometres per hour, while their older counterparts should look at reaching at least four kilometres per hour, to breathe in the least amount of pollution over a trip. Bigazzi also computed these ideal travel speeds for other road grades.

"If you move at much faster speeds than the MDS — say, cycling around 10 kilometres faster than the optimal range — your inhalation of air pollution is significantly higher," said Bigazzi. "The good news is, the MDS numbers align pretty closely with how fast most people actually travel."

The findings, which build on Bigazzi's recent research on the high amounts of toxic chemicals absorbed by cyclists on busy city streets, are described in a paper published in the *International Journal of Sustainable Transportation*.

Future research will validate the minimum-dose speed estimates with on-road data.

OPTIMAL WALKING AND CYCLING SPEEDS FOR CITY ROADS TO MINIMIZE AIR POLLUTION INHALATION

*Bicycle = Biking | **Shoe = Walking

10 THINGS YOU NEED TO KNOW ABOUT THE MODERN TREATY PROCESS IN BC

TREATY NEGOTIATIONS

The treaty process currently underway in BC is among the most complicated ever undertaken in any jurisdiction. So if it seems like a mystery wrapped in an enigma and served with a side of confusion, you're not alone. Initiated in 1992, this modern process embodies 150 years of fraught history, during which time the province's First Nations were systematically stripped of their rights to land, culture and independence. It's a lot to catch up on. What's actually going on at those negotiation tables? Who's involved? And what happens next?

The leaders, students and graduates of SCARP's Indigenous Community Planning (ICP) master's program are experts at working with First Nations to navigate a central treaty component: community planning in a way that accounts for a Nation's past and present in its future. If community planning is the visioning, treaty-making forges that vision — of a more just and inclusive Canada — into something real. It's a lot to digest, but this quick reference guide will get you up to speed — at least for the water cooler conversation on Monday.

Photo: Hans-Jürgen Hübner

1) BC is special.

In the nineteenth century, the new Dominion of Canada already had a long history of treaty-making. But when BC joined Confederation in 1871, Aboriginal title on the mainland was unresolved and successive governments openly denied Indigenous rights to land. It wasn't until the 1990s, after the 1982 Constitution Act affirmed Aboriginal title and rights that the modern treaty process got underway.

2) Every treaty is different.

Every Nation has different priorities, but they all address some central concerns: self-government; land title; economic settlement; jurisdiction over natural resources; community health, education and employment; and historic reconciliation. UBC's ICP students spend eight months on a reserve learning to tailor the planning process to the character and goals of individual communities and helping to create visioning documents specific to them.

3) It's been a long time coming.

For over a century, First Nations in BC have fought for a formal recognition of Aboriginal title. The modern treaty process is that long-awaited recognition. As soon as it was initiated, 42 nations declared their intent to negotiate. Today, 60 First Nations are involved in 49 sets of negotiations. The treaties with the Tla'amin Nation, the Tsawwassen First Nation and the five Maa-nulth First Nations are already concluded.

4) Treaties protect Canada's land and resources.

First Nations see their history and identity as intrinsically connected to the land. The land awarded to a Nation by treaty comes from Crown land, not private property, and typically amounts to just a fraction of that Nation's historical territory. But that fraction often holds spiritual, archaeological or environmental significance to that Nation's people. ICP teaches the primacy of land and imparts a land-based methodology for planning a community. The result is a Nation of people (re)connected to their roots and clear about what they want for their land's future.

5) Treaties provide certainty.

We've all heard the phrase "duty to consult," but the federal government has offered minimal guidance on what that means. Treaties define that duty, so that once in possession of both a community plan and a ratified treaty, First Nations along with government and industry can move the development conversation forward, confident about what will work for the land and for everyone it supports.

6) The process is just as important as the outcome.

The *outcome* of Indigenous community planning leaves First Nations with a clear vision they can take to the negotiation table. But the planning *process* is what brings community members together in the first place. It makes clear to everyone their stake in what happens, which means that all community members — not just their leaders — are whole-heartedly invested in their treaty negotiations.

7) Everyone takes part.

In effective Indigenous government, decision-making lies not with the leaders but with the collective. That also means effective treaties happen only with collective involvement. The treaty process recruits whole communities, from Indigenous youth to tribal elders, to articulate — in a living, breathing, social contract — what their government will look like. ICP parallels this approach at the community level, ensuring every individual has a voice in the future of the Nation.

8) Treaties level the economic playing field.

The Indian Act of 1876 and the reserve system have prevented First Nations from participating in the kind of economic development enjoyed by the rest of the country: neither reserve land nor the personal property of anyone living on reserve could be used as collateral on a business loan. But the land and cash settlements that come with treaties provide the capital and collateral Aboriginal businesses need to thrive.

9) Treaties boost BC's economy.

In 2009, PricewaterhouseCoopers predicted that treaty settlement will increase investor certainty in development and resource projects in BC — to the tune of $10B.[1] The economic and territorial certainty that treaties provide means that First Nations are at lower risk for exploitation and industry is at lower risk for litigation. Trust leads to partnership, which leads to prosperity.

10) Treaties play a role in reconciliation.

This might be the thorniest aspect of the treaty process, because there are high and heavy hopes that modern treaties will mark the end of Canada's history of cultural suppression, economic marginalization and bad-faith dealings with First Nations. The goal of modern treaties is nothing less than to mend relationships for a more prosperous future.

The first program of its kind in North America, ICP is helping lay the foundation for this future by building and nurturing strong relationships with First Nations. Of primary importance is Musqueam, on whose traditional lands UBC sits, and whose elders co-create, co-teach and co-administer the ICP program.

Maybe it's not so complicated after all. Modern treaties clarify Indigenous rights and powers through a conversation that is more than a century overdue. As the process moves forward, it's a chance for all of us to take part in that conversation with a little more clarity and grace.

[1] Financial and Economic Impacts of Treaty Settlements in BC (November 2009) Prepared for the BC Treaty Commission by PriceWaterhouseCoopers.

HATCH

A NEXT STEP IN THE ENTREPRENEURIAL JOURNEY

For many years, UBC has hit above its weight in patenting research outcomes. Recently, the university has been devoting considerable resources to another innovation pathway: entrepreneurship. The main driver of this initiative is e@UBC (entrepreneurship@UBC), housed in the Graham Lee Innovation Centre, where new ventures work in a collective startup space, and educational workshops equip budding entrepreneurs with startup knowledge. e@UBC provides support for faculty, students, staff and alumni who have graduated within the past five years to help them move new ventures from the idea stage to market launch.

E@UBC'S BLAIR SIMONITE (APSC '81 ECE) spent more than 25 years in Vancouver's tech sector in various executive roles before volunteering as an e@UBC mentor. Impressed by the university's startup energy and innovations, he jumped at the opportunity to give back and became e@UBC program director in 2013.

In December 2016, e@UBC Managing Director Barry Yates joined the team, bringing over 25 years of entrepreneurial experience in the marketing, software-as-a-system (SaaS), transportation, telecom, retail and industrial products sectors.

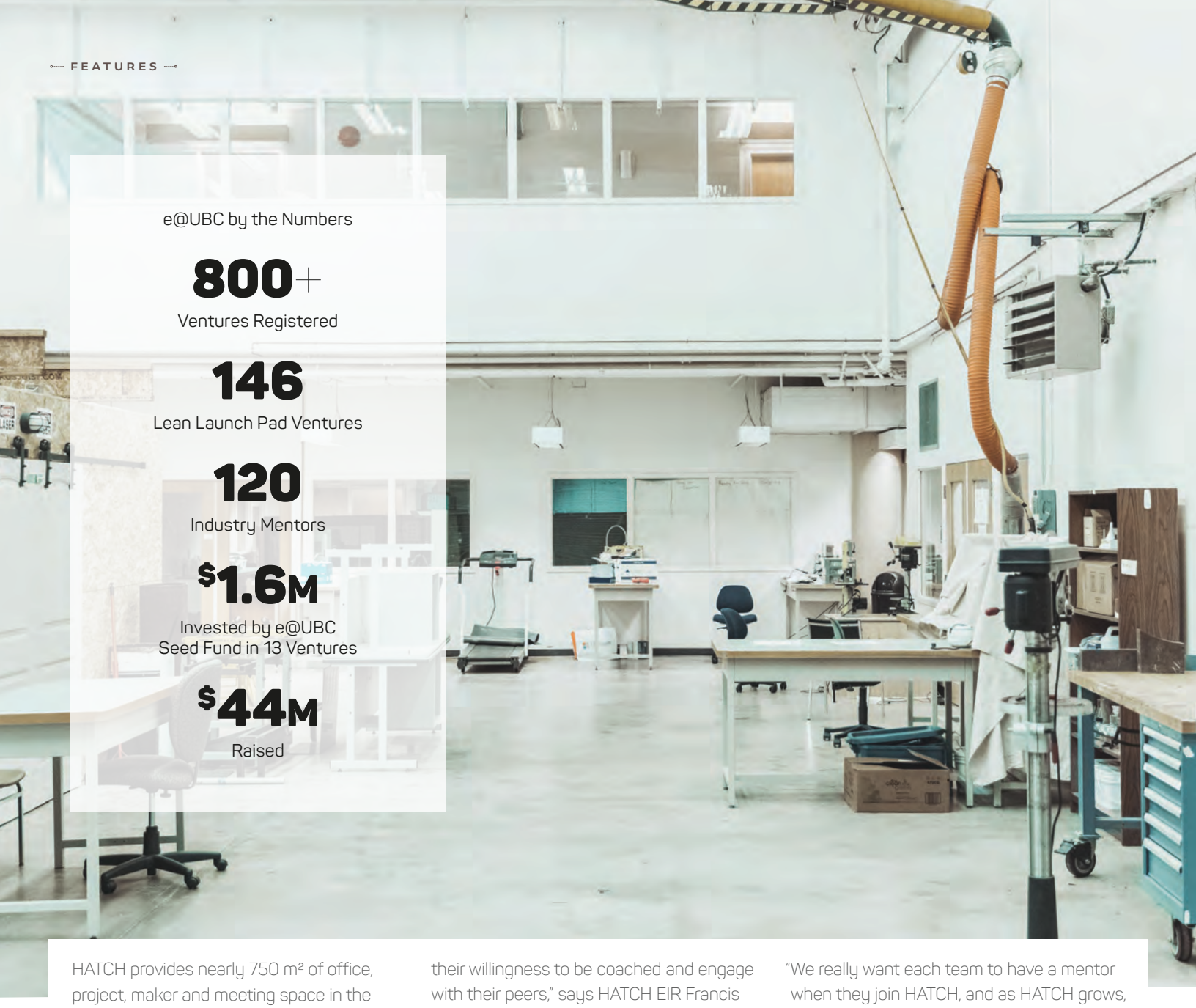
"UBC has a critical role to play in providing support for future entrepreneurs," stresses Yates. "With $600 million in research funding, the opportunity to bring research breakthroughs from lab to market is key to building out the startup ecosystem in Vancouver, and globally."

When aspiring entrepreneurs approach e@UBC with a venture idea, they are encouraged to apply to a venture cohort stream that will take them through elements of building a startup. Along the way, they will apply to participate in the Lean Launch Pad (LLP), a startup accelerator program with an intensive mentorship component that focuses on customer discovery. Venture teams are required to contact potential customers during the five-week program, to "test the waters" for their product or service. Many end up pivoting as a result, and having a clearer focus on the end market.

The process is rigorous, but the LLP encourages entrepreneurs to "fail forward," so that ventures are validated at an early stage.

The journey does not stop there. Entrepreneurs can receive further one-on-one mentoring, apply for the recently launched Creative Destruction Lab-West for "massively scalable" ventures and/or apply to join HATCH, for technology-based ventures that are building a prototype and building their business.

Launched in October 2016, HATCH is a collaboration among e@UBC, the Institute for Computing, Information, and Cognitive Systems (ICICS), the Faculties of Science and Applied Science, and the Sauder School of Business.



e@UBC by the Numbers

800+
Ventures Registered

146
Lean Launch Pad Ventures

120
Industry Mentors

$1.6M
Invested by e@UBC Seed Fund in 13 Ventures

$44M
Raised

HATCH provides nearly 750 m² of office, project, maker and meeting space in the ICICS/Computer Science building, for up to 30 ventures at a time. Ventures are eligible for the donor-supported HATCH Concept Fund to help them develop their businesses. Crucially, a full-time Entrepreneur-in-Residence (EIR) advises the ventures daily — on business development, product market fit, marketing and team building, while building community and mutual support among the ventures through CEO roundtables and guest speakers. Events, workshops and informal support from the UBC entrepreneurial community help HATCH ventures reach their goals.

"We select ventures for HATCH based on the quality of the team, the product market fit and their willingness to be coached and engage with their peers," says HATCH EIR Francis Steiner. "We need the teams to be open to mentoring and to learn from one another's successes and missteps. They need to understand that they can't do it all alone."

Venture teams have roughly 12 months in HATCH, and a six-month overlap between cohorts allows new teams to learn from previous ones. The first two cohorts include ventures focused on water purification, industrial optics, pipeline inspection, painless vaccine injection, electronic micro-gardens, skin animations, autonomous drone flight for infrastructure inspections, realistic motion for simulated characters, and oil collection using nano-nets.

"We really want each team to have a mentor when they join HATCH, and as HATCH grows, we will need more mentors," says Steiner. "Mentoring early-stage ventures that have been validated by e@UBC programs can be incredibly rewarding. It also gives you a privileged look at some potentially highly successful companies and people. It is extremely exciting."

HATCH itself is a startup, and if things go well, will outgrow its space in ICICS in the coming years to house up to 50 ventures annually. Stay tuned.

For more information, please contact info@entrepreneurship.ubc.ca or visit www.HATCH.ubc.ca.

HATCH labs Photos by: Paul Joseph.

SARAH DAINTREY RECEIVES MCEWEN FAMILY TEACHER AWARD

Sarah Daintrey of Clayton Heights Secondary School is the recipient of the 2017 McEwen Family Teacher Recognition Award, which celebrates teachers and their influence on students, both academically and personally.

Presented annually by the Faculty of Applied Science, the award was established by Dr. James McEwen (BASc '71, PhD '75), PEng, and his family. The award is student nominated, and was put forth by UBC Engineering student Nolan Wark (MECH).

Daintrey is involved extensively in charitable work. What she loves most about her job is providing students with opportunities to make a positive impact, and in that vein, has been a large part of a student initiative called "Project Equal," which has worked in 10 countries, doing work that has included building a well in Syria as well as a school in Ecuador and Sierra Leone. "It really was a life-changing experience," says Wark.

"She is not just a teacher, she is a mentor, a motivator and a role model," says Aly Nuruddin, a former student who supported the nomination. "She has inspired so many students, to not only make a difference in the school but to make a difference in our community and in the world."

Clayton Heights Secondary School will receive $5,000 for enrichment activities, programs or development and will be allocated a $5,000 scholarship for a current high school student to attend UBC.

FLEXIBLE SENSOR

ENGINEERING DECONSTRUCTION

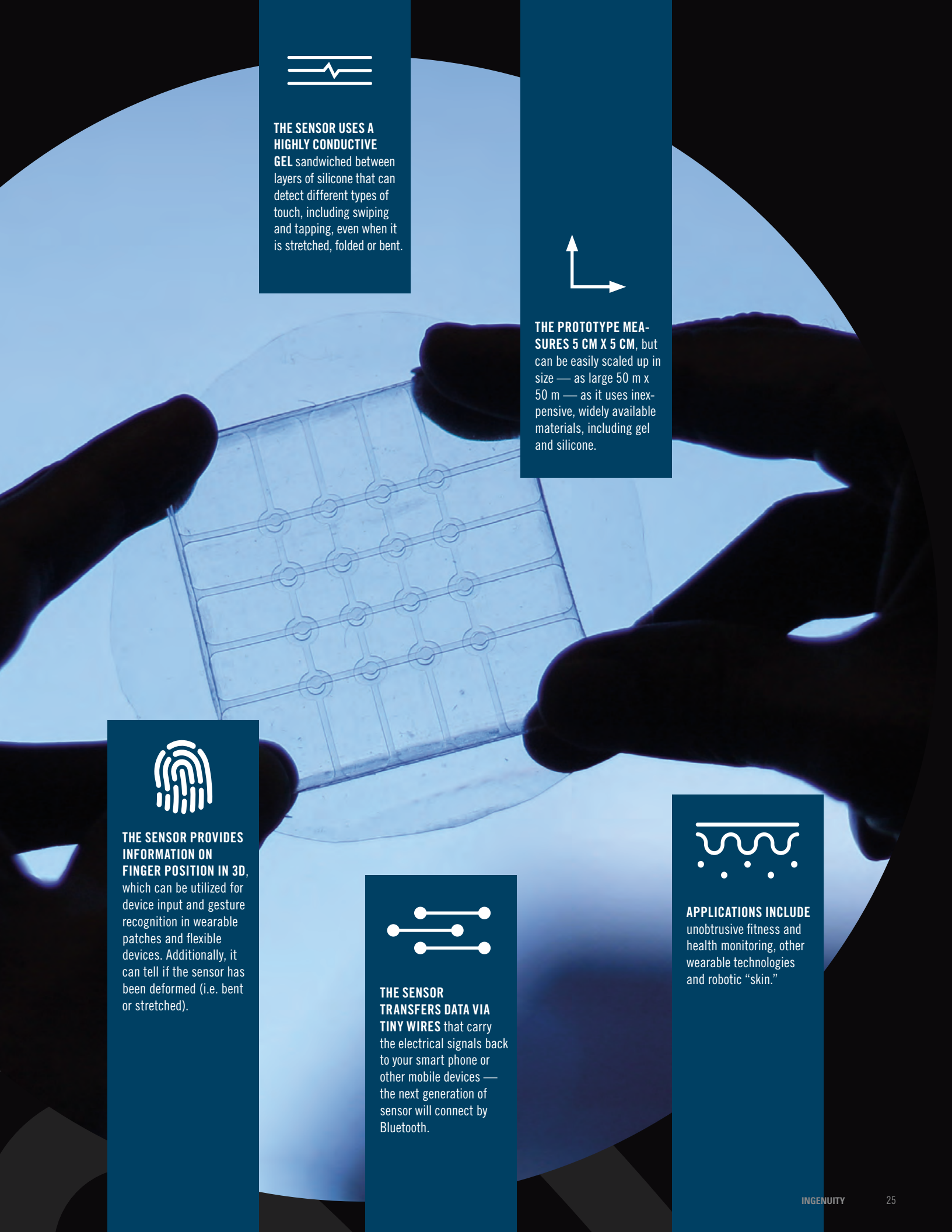
PICTURE A TABLET that you can fold into the size of a phone and put away in your pocket, or an artificial skin that can sense your body's movements and vital signs. A new, inexpensive sensor developed in the Department of Electrical and Computer Engineering could help make advanced devices like these a reality.

JOHN MADDEN

Director, Advanced Materials and Process Engineering Laboratory (AMPEL) and Professor, Electrical and Computer Engineering. Researching artificial muscle and application to medical devices, photosynthetic photovoltaics, super-capacitors, batteries, sensors and carbon nanotube devices.

MIRZA SAQUIB SARWAR
(MASC '14 ELEC)

PhD Student, Electrical and Computer Engineering. Researching flexible electronics focusing on human computer interfaces such as touch screens.



THE SENSOR USES A HIGHLY CONDUCTIVE GEL sandwiched between layers of silicone that can detect different types of touch, including swiping and tapping, even when it is stretched, folded or bent.

THE PROTOTYPE MEASURES 5 CM X 5 CM, but can be easily scaled up in size — as large 50 m x 50 m — as it uses inexpensive, widely available materials, including gel and silicone.

THE SENSOR PROVIDES INFORMATION ON FINGER POSITION IN 3D, which can be utilized for device input and gesture recognition in wearable patches and flexible devices. Additionally, it can tell if the sensor has been deformed (i.e. bent or stretched).

THE SENSOR TRANSFERS DATA VIA TINY WIRES that carry the electrical signals back to your smart phone or other mobile devices — the next generation of sensor will connect by Bluetooth.

APPLICATIONS INCLUDE unobtrusive fitness and health monitoring, other wearable technologies and robotic "skin."

THE NEXT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DEPT. of A.I.
3-D
BIO MED
V.R. 20mg
V.R. 20mg
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FAST Industries
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COMMUNITY & REGIONAL PLANNING
NURSING
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SCANNING PATIENT...
UBC
to ARCH-ITEC-TURE
D N A
ALGO-RITHM DEPT.
City Plan

"Heavier-than-air flying machines are impossible," declared Lord Kelvin, President of the Royal Society, in 1895. "The growth of the Internet will slow drastically. ... By 2005 or so, it will become clear that the Internet's impact on the economy has been no greater than the fax machine's," announced Nobel Prize-winning economist Paul Krugman in 1998. "Two years from now, spam will be solved," blurted Bill Gates in 2004.

The future cannot be predicted, but futures can be invented.

-Dennis Gabor, Nobel Prize-winning inventor of holography

Why bother trying to predict the future — the distant future, in particular? It's ultimately unknowable, after all, and publicly prognosticating about it is a thankless endeavor: if you're wrong, you may be laughed at (albeit posthumously), and if you're right, you probably won't be around to enjoy any praise that comes your way.

But there is value in looking ahead. It is only by contemplating possible futures for humanity that we can prepare ourselves for what may come to pass. If possible, we might also decide what kind of future looks best to us and steer ourselves, as best we can, in that direction.

Since applied science impacts every aspect of our lives — from health and communication to entertainment and the environment — its future will, to a large extent, determine the future of our planet. So who better to ask what tomorrow will bring than members of UBC's applied science community?

Here are some of their replies to the question, "What will your field look like in 100 years?"

YEARS OF APPLIED SCIENCE

Illustration by Raymond Biesinger

Unbreakable smart skin. Invisible, unobtrusive and tougher than graphene, it will not only monitor and automatically regulate things like temperature, humidity, pressure and air flow, but also protect our bodies from scrapes and gunshots and everything in between. The artificial skin will also be used to restore full sensory capacity to people with nerve damage or (when paired with prosthetics, which themselves will be seamlessly integrated with the body and brain) missing limbs.

Microscopic, implantable, body-powered sensor-analyzers. Around-the-clock monitoring of vitals, blood and just about anything else inside your body will be performed by implanted sensors just a few microns in size. Powered by body energy (heat, sound, movement) and protected by a special coating, they will generate real-time health reports from "womb to tomb." What's more, these sensors will be capable of precise stimulation of the brain, nerves, muscles and other parts of the inner body to aid the treatment of various disorders.

Sensors will be capable of precise stimulation of the brain, nerves, muscles and other parts of the inner body to aid the treatment of various disorders.

Underground living. Cities will be not just taller, but deeper — much deeper. Extensive interconnected tunnels, caverns, shafts and galleries will be used for living and office spaces, transportation, warehousing, manufacturing, recreation, energy storage/generation and food production. This will increase spatial density and infrastructure efficiency, as well as allow vast swaths of above-ground space to be reclaimed as sustainable, healthy living environments.

Faster, better, cheaper manufacturing. Products that vastly exceed today's technologies in quality, complexity and performance will be developed and manufactured at a fraction of the cost and speed — thanks in part to advanced 3D printing and computer modeling/simulation capabilities, which will enable designs to be tested, iterated and perfected (from both functional and customer satisfaction standpoints) in a digital environment before the first physical version is ever produced.

Algorithmic architects and planners. Equipped with powerful machine learning algorithms, computers — not human architects, engineers or planners — will design the buildings and cities of the future. By processing user inputs and vast quantities of historical data, artificial intelligence systems will craft plans that strike an optimal balance between citizen/occupant needs, cost, constructability, social equity, cultural diversity and environmental impact.

Virtual reality pills. Forget VR goggles, VR headsets, even VR rooms; if you want to feel like you're in another reality, you need to alter the chemistry of your brain. A century from now our understanding of neurochemistry and engineering processes will be such that whole experiences — zipping down the slopes in the Swiss Alps, or hiking on Mars — will be delivered in the form of a pill or some other means of neural manipulation.

Smarter medicine. Using next-level medical simulation and other technologies, doctors will be able to design and execute the optimum personalized treatment strategy for every patient. For their part, surgeons will have detailed real-time medical images and procedural guidance projected directly into their brains as they operate with robot assistance. In addition, many clinical procedures will be obsolete;

We will finally have homes, vehicles and industrial facilities — all intelligently self-controlled — that generate as much clean energy as they consume.

instead of joint replacements, for instance, damaged cartilage will be selectively regrown.

Space materials. The Stone Age, the Bronze Age, the Iron Age: materials have defined entire eras and the twentieth century saw many other materials (silicon, fibreglass, plastics, polymers and various alloys among them) transform our world. In the coming century, humans will witness the discovery of a completely new material — probably somewhere in space — that will enable the development of technologies unimaginable today, as well as develop and manipulate materials beyond the nanoscale.

Software everywhere. Just as the industrial revolution saw machines extending and enhancing our physical abilities, the software revolution is extending and enhancing our mental ones. With robots taking over or augmenting most mechanical tasks, there will be more resources for creative thinking and intellectual advancement. Yet, as ever-larger quantities of software are produced, the need for quality checks and security safeguards will become even more crucial than they are today.

Designer microorganisms. Artificial enzymes and microorganisms will be routinely designed and synthesized from scratch to enable the creation of products that meet humanity's health, energy, manufacturing and other needs. Using cheap, renewable ingredients, these custom-made molecules and microbes will produce minutely tailored pharmaceuticals, biofuels, biomaterials and specialty chemicals in any quantity and at low cost.

A net-zero energy world. Having figured out how to efficiently and economically harness energy from the sun, wind, waste and other renewable resources, we will finally have homes, vehicles and industrial facilities — all intelligently self-controlled — that generate as much clean energy as they consume.

Recycling processes will also be much faster, safer and more accurate, being robot-operated and fed products that have been designed with future disassembly in mind.

Space mining. Mining will be more mechanized and automated, enabling value to be extracted from lower-grade deposits and in challenging geological environments, including outer space. An advanced understanding of the mineral microbiome will also allow the development of new biotechnologies that use bacteria and other means to obtain energy and carbon from minerals. By removing barriers to entry, such technologies will democratize mineral extraction and ultimately transform the mining industry.

Future homes will be transitory and biodegradable. Temporary housing solutions will be accessible broadly and quickly at a fraction of the environmental and financial stress caused by permanent, traditional residences. When "the big one"— the inevitable earthquake that is predicted to decimate a significant portion of the Pacific Northwest — hits, millions of people will be rendered homeless. Future community planners and architects will provide a solution of "pop up communities" for fast response to crisis situations that can be disassembled and relocated with ease. Unlike your IKEA furniture (which we know can't withstand more than one or two disassembles before making its way to the landfill), once these temporary structures begin to deteriorate, parts can be reused, recycled or left to biodegrade.

SO YET SO FAR

It isn't unusual for two people who live or work in close proximity to have little interaction. But what if they're both tech entrepreneurs with similar backgrounds, interests and complementary strengths? One might wonder why they don't connect more often.

Vancouver and Seattle are kind of like these people. Not only are they just 120 miles apart, they also have many commonalities: diverse, well-educated populations, robust business sectors, close ties with Asia, excellence in areas like biotechnology and computer games. However, as the Boston Consulting Group (BSG) noted in a 2016 report, "their level of connectedness is more akin to cities that are 2,000 miles apart."

This gap (and how to close it) is the focus of the Cascadia Innovation Corridor Conference. Now, going into its third year, the annual conference brings together leaders in business, academia and government in the Pacific Northwest to identify opportunities for stimulating regional growth and collaboration. Featuring discussion on a wide range of topics — from clean tech and education to smart cities and venture capital investment — the conference has signaled a renewed interest in strengthening bonds between BC and Washington. The envisioned "corridor" would facilitate the flow of people, ideas and resources across the border, creating a vibrant, unified innovation hub that is competitive on a global scale.

THE ENVISIONED CORRIDOR WOULD FACILITATE THE FLOW OF PEOPLE, IDEAS, AND RESOURCES ACROSS THE BORDER, CREATING A VIBRANT, UNIFIED INNOVATION HUB THAT IS COMPETITIVE ON A GLOBAL SCALE.

CLOSE

A key ingredient in this bubbling tech cauldron is UBC, whose president, Santa Ono, spoke at the 2017 conference. The BSG report identified universities as one of five "innovation enablers," and UBC has been working to establish stronger collaborations and research partnerships in the region. Among these are:

- *a consortium aimed at reducing carbon emissions in commercial aviation; members include Boeing, Noram Engineering, sustainable jet fuel company SkyNRG and a number of other stakeholders in the aviation industry, including Air Canada and WestJet*
- *the Cascadia Urban Analytics Cooperative, a UBC-University of Washington (UW) partnership that uses data science to address major urban issues like health and homelessness; supported by a $1 million gift from Microsoft*
- *the Global Innovation Exchange, a Bellevue, WA-based graduate technology school that UBC joined in 2017; founded by UW and Tsinghua University, with support from Microsoft*
- *an initiative called "Transportation Futures," which UBC's Clean Energy Research Centre is in discussions with UW to collaborate on; partners currently include Simon Fraser University and the University of Victoria*

The idea of fostering closer ties within the Cascadia region is not new. But at the 2016 Cascadia conference — a high-profile event whose attendees included Bill Gates and Microsoft CEO Satya Nadella — former BC Premier Christy Clark and Washington Governor Jay Inslee made a formal commitment to help each other make it happen. By signing a memorandum of understanding, they agreed to take measures that would facilitate trade and access to capital, as well as advance joint programs in areas such as research, education, workforce development and transportation.

Several promising developments have taken place since then. On the transportation front, for instance, there are plans to establish a seaplane route between Vancouver's Coal Harbour and the Seattle area, and Washington state has committed $1 million to an assessment of the feasibility of building a high-speed rail between Vancouver and the US Northwest; the line would transport commuters between Vancouver and Washington in under an hour. And the region's technology sectors will likely get a significant boost thanks to the formation of the Cascadia Innovation Network, aimed at connecting entrepreneurs with innovation partners and each other, and the Seattle-Vancouver Financial Innovation Network, an "international financial center" that will facilitate tech financing.

While it is unlikely that this joining of forces will create another Silicon Valley, greater cooperation between Vancouver and Seattle may make them more attractive destinations for top talent and enable growth at a level that neither city could achieve independently.

Illustration by Tom Froese

Clear Image, Dark Well

DarkVision Technologies Turns Entrepreneurial Light on the Oil Sector

Most "basement stories" begin with a worn-out credit card and excruciating work hours, but this entrepreneurial story also begins with a delivery truck lost in the suburbs, driving in circles and swinging its heavy load of pipe through the North Vancouver streets.

Expecting an industrial park, the confounded driver calls the customer: "Is this the right address?" he asks. "This looks like a residential neighbourhood."

"Just toss the oil pipe on the front lawn," replies the customer. He will roll it over to the garage later in the day.

As CEO Stephen Robinson (BASc '05 MECH) relates the basement story of DarkVision Technologies, he smiles almost apologetically, as if we've heard it all before. Yet DarkVision has become a bona fide success story, especially for three experienced entrepreneurs who, despite their relatively young age, have not only developed a unique imaging technology for the oil and gas sector, but have also brightened the entrepreneurial path for many UBC students.

That such an upstart company would support emerging tech talent may come as a surprise, but UBC is the alma mater of both Stephen (with his passion for imaging systems) and Graham Manders (BASc '06 MECH) (CTO and engineering mastermind behind DarkVision's innovations). Like any entrepreneur starting out today their careers began with an idea, with technical talent and business acumen that over the years has led to not one, but two successful imaging companies.

Founded in 2005, their first startup, ClearVision, outfitted assembly lines for the manufacture of cardboard boxes with "intelligent camera systems." After a winsome buy-out in 2011, Graham and Stephen opted to convert that windfall into an entirely new venture, seeking a niche that no other optics company was filling — or filling well.

Above: High-resolution imaging isn't just for medical patients anymore. DarkVision has spent years developing a new ultrasound-based imaging technology that can image an oil well dozens of kilometres long at the submicroscopic level. Deployed by either wireline, e-coil or tractor, the advanced tool can perform a 360-degree scan of the deep dark well. Right: DarkVision's founders Stephen Robinson (left) and Graham Manders visit UBC, their alma mater.

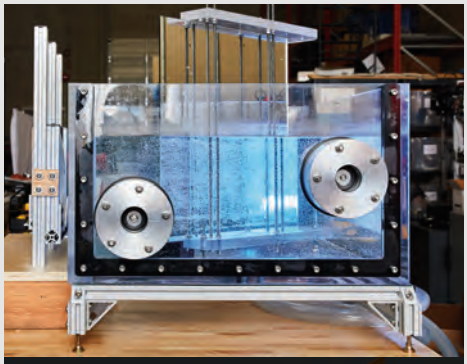
After some business reconnaissance in the Alberta oil sands — over the past three years, Stephen has flown to Calgary over 100 times — a niche began to present itself. It became apparent that oil companies needed to more effectively monitor the sludgy, cumbersome gastronomy of gas wells. "Initially, we looked at many different opportunities in oil and gas," says Stephen, "before deciding to go upstream in the value chain to the wells themselves." The enterprising pair also had the good fortune of meeting Osman Malik, a veteran of the oil and gas sector who would co-found the company with them and become CFO.

Though it would take time and patience to develop, their optics technology would, in 2014, be named the top New BC Venture, snagging the BC Innovation Council's $100,000 prize. Soon Cenovus, Suncor and other oil corporations would become DarkVision customers, drawn by this new paradigm-changing technology that could illuminate the blind spots of an oil well whose deep dark inaccessibility can significantly impact operational efficiency, and potentially the environment. This includes pipe failures and casing problems, connection cracks and corroded downhole devices, even the build-up of "scale" and other precipitates that affect well production.

But how did the trio maneuver their vision into entrepreneurial success? Like many tech start-up narratives, this story of DarkVision involves choices. In this case, there was the question of which technology platform to use: Camera? Laser Scanner?

Both of these potential platforms were almost immediately ruled out because of the sludgy, inhospitable environment of the average gas well. For any camera to function in fluid, the conditions must be virtually pristine. "You can't even use a Go-Pro in the Fraser River," says Stephen. "It's too muddy."

So what platform would become the future of DarkVision?



Over the years DarkVision has enlisted UBC engineering students through the capstone project program. By presenting our fourth-year undergrads with an engineering challenge, DarkVision has not only given these future professionals real-world experience, but also benefited itself by incorporating many of their imaginative solutions.

The Shape of the Entrepreneurial Pulse

Enter DarkVision's impressive maker space: prime square footage in a North Vancouver industrial park which is light years from Stephen's basement.

Along a high table, engineers peck at laptops. Across the vaulted room runs a long, stainless steel tank of warm liquid — a test well — with a submerged industrial pipe and what resembles a high-tech sink router. This curious tank was custom-made; after all, no maker space has ever required or could possibly make use of a 60-ft long horizontal test well.

For this reason, the trio had UBC mechanical engineering students build the tank as part of their fourth year capstone design project. A supporter of UBC Engineering Co-op scholarships, student team awards and multiple Engineering Alumni Networking Nights, DarkVision, Stephen says, has always been inextricably linked to the development of talented, innovative students. After all, their employees are mostly UBC engineering grads.

"While it's great that the students got some value from the experience," says Stephen, "that test well was critical to us. We pushed the team pretty hard because we really needed it to test our ultrasound imaging prototypes."

Why use ultrasound? The team discovered that while a digital camera would become a muddy mess down in a well, ultrasound would provide high-resolution 3D scans of the wells. The system isn't dissimilar, at least in principal, to the ultrasound you might undergo at the hospital, but to test whether this tool could weather a tempestuous, real-world oil well, they needed to simulate that gooey environment — hence the student-built tank.

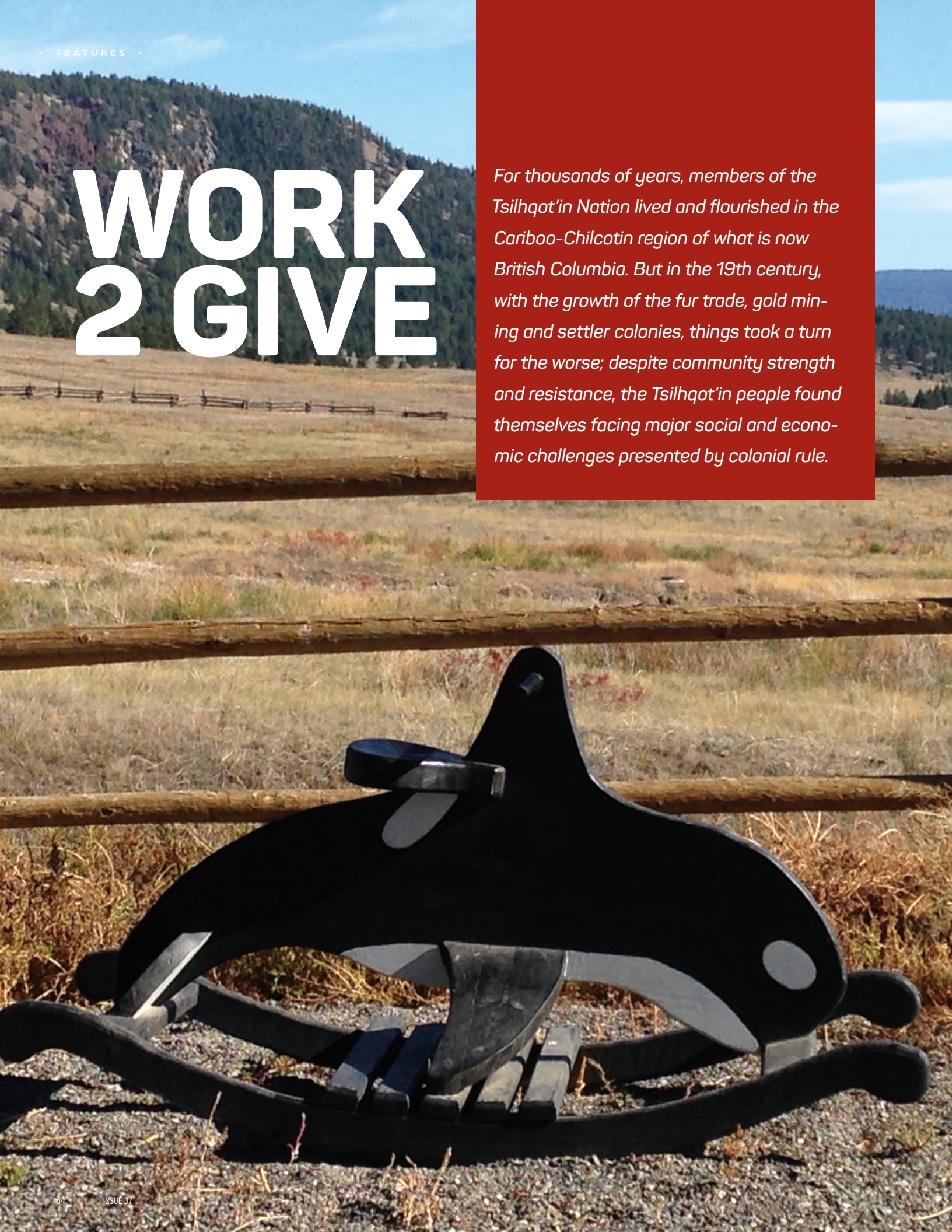
How does it work? Ultrasound pulses pass through the fluid, hit the metal and bounce back, all the while sketching a sub-millimetric picture over time and space (over several kilometres of underground pipe). To gauge the success of this device, which is housed within the aforementioned "router" tool, the engineers needed precise feedback on those pulses.

For this stage of its development, DarkVision once again had help from eager students — this time from engineering physics — who managed to create imaging technology for the measurement of the ultrasound curve. In plain terms? Imagine a camera that can assess the functioning of your hospital ultrasound.

Talking excitedly about the company's growth plan and their product's increased market demand, Stephen then apologizes because he has to leave for a flight to Calgary — to meet with another potential customer.

WORK 2 GIVE

For thousands of years, members of the Tsilhqot'in Nation lived and flourished in the Cariboo-Chilcotin region of what is now British Columbia. But in the 19th century, with the growth of the fur trade, gold mining and settler colonies, things took a turn for the worse; despite community strength and resistance, the Tsilhqot'in people found themselves facing major social and economic challenges presented by colonial rule.



To this day, racism and marginalization in the health, educational and social sectors remain significant barriers to the wellbeing and economic prosperity of the Tsilhqot'in and other Indigenous peoples in Canada. The situation is especially dire in the realm of criminal justice: despite making up just three per cent of the Canadian adult population, Indigenous people account for 26 per cent of admissions into Canadian correctional facilities.

To address some of these inequities, the Correctional Service of Canada (CSC) and the Tsilhqot'in First Nation created Work 2 Give (W2G), a unique partnership that donates high-quality furniture, toys, clothing and cultural objects, as well as fresh organic vegetables, to Tsilhqot'in families in the region. The source of these goods is Indigenous men incarcerated in federal prisons across BC, who tend the vegetables and craft the donated products — beds, drums, moccasins, knitted hats and mittens — with their own hands.

In this way, W2G seeks to give Indigenous inmates not only employment skills, but also meaningful work that promotes rehabilitation and improves the quality of Tsilhqot'in families' lives. What's more, by filling inmates' long days and nights with productive activities, W2G aims to curtail the drug use, violence and depression that are often correlated with life in hyper-masculine prison environments.

In 2014, Drs. Helen Brown and Colleen Varcoe, both professors in UBC's School of Nursing, joined W2G as academic collaborators and set out to determine how successful W2G was at meeting its objectives. Their team conducted extensive interviews with inmates, Tsilhqot'in community members and leaders, and stakeholders within CSC. They observed the distribution of W2G items and their use in Tsilhqot'in communities, including cultural events. They collected and analyzed data from federal prisons to determine what impact, if any, participating in W2G had on inmate rehabilitation. Over the course of two years, using this mixed methods and ethnographic approach, they have steadily built a body of evidence suggesting that W2G can improve health and social wellbeing and strengthen cultural identity among incarcerated men and recipient communities.

"Work 2 Give has given inmates the positive sense of self that develops when you help others and feel that you can create a better future for yourself," says Brown. "But what has been more unexpected is the way the Tsilhqot'in families have engaged with the items they've received and, indirectly, with the people who made them. The Work 2 Give initiative is fostering the restoration and strengthening of connections between inmates and the communities they come from."

To date, these connections have taken a number of different forms. Youth drumming circles, created as a crime prevention initiative, use W2G drums. First Nations elders slept in W2G beds while being hosted at a community centre during the BC Elders Gathering in 2016. Children removed from their homes by BC's Ministry of Children and Family Development (MCFD) have found W2G sock monkeys in the care packages they receive, and donated beds have been used to support families in meeting MCFD requirements to have their children returned home from care. Members of recipient communities want to support the men's rehabilitation, Brown says, and have even suggested making more direct contact with the men in order to show their gratitude and their investment in the men's wellbeing.

Working in close partnership with the CSC, Tsilhqot'in community leaders, community distribution partners and advisory groups, the UBC-based team is now attempting to grow and expand the reach of W2G and to create sustainable models for it within federal prisons and Tsilhqot'in communities. By improving rehabilitation programs for Indigenous offenders, Brown hopes to help reduce the discrimination experienced by Indigenous peoples in the Canadian criminal justice system.

"Creating tangible objects that can enrich a child's life is very different from typical prison work, which doesn't usually qualify as meaningful activity," says Brown. "Making things — useful things that will be valued by others — gives many of these men a sense of value and purpose and encourages them to think of people other than themselves. We've seen how Work 2 Give restores community members' support for the men's healing and rehabilitation and fosters accountability among offenders — all of which contributes to the creation of healthier, safer communities."

Rocking orcas, sock monkeys and traditional drums are just some of the items made for Tsilhqot'in families by Indigenous inmates involved in Work 2 Give.

Glorious Instrument

The Outgoing Design of Bing Thom

Unlike the other international architects bidding for the Fort Worth contract, Bing Thom flew to Texas a few days early. The other competitors had already prepared their designs for the new Tarrant County College campus, while Thom, even the afternoon before the presentation, had yet to put pencil to paper.

Instead, as his co-worker Michael Heeney nervously looked on, the Vancouver architect meandered the inner city, speaking to locals and cab drivers as some architects might consult with an urban developer. Thom even asked local artists, "So what is the colour of Fort Worth?" Only at the eleventh hour did Thom actually sketch out his design for the campus, which his firm won after presenting details about the city and the landscape that even local administrators weren't aware of.

While Thom's designs often drove to the essence of place and community, the realization of those fabled constructions demanded exceptional patience. International attention for his performing arts centres and suburban innovation came fairly late in his career, as Thom was especially "persnickety" regarding his choice of projects. Few, if any, of his designs were motivated by money; his concerns leaned towards what he called "the greater good."

As an "outspoken provocateur with a lively mind on constant alert for a greater good," as SALA director Ronald Kellett described Thom, it's perhaps no surprise that the architect embraced the concept of sustainability long before the term was coined. Commissioned to build what became the critically acclaimed Canada Pavillion for Expo '96, in the sweltering summer heat of Seville, Spain, Thom was the first to naturally "air-condition" a structure. He even outfitted the interior courtyard with glassy walls of water.

> "FROM AN ECOLOGICAL VIEWPOINT HE WAS LIGHT YEARS AHEAD OF EVERYBODY ELSE, YET WHEN THE APPROACH BECAME FASHIONABLE YEARS LATER, BING BECAME ALMOST CONTRARIAN. HE WAS SO DISTRESSED THAT ARCHITECTS WERE BECOMING PREOCCUPIED WITH ECOLOGICAL CONCERNS. HE WORRIED THEY WERE FORGETTING ABOUT DESIGN."
>
> – Michael Heeney, President and CEO of the Surrey City Development Corporation

"From an ecological viewpoint he was light years ahead of everybody else," says Michael Heeney, principal at Bing Thom Architects, "and yet when the approach became fashionable years later, Bing became almost contrarian. He was so distressed that architects were becoming preoccupied with ecological concerns. He worried they were forgetting about design."

Given that Thom eventually garnered international renown for his performing arts arenas, including Washington, DC's Arena Stage and the Chan Centre for the Performing Arts at UBC, his Surrey Central City project might seem an aesthetic, or even career digression. Yet Thom, with considerable resolve and patience for bureaucracy, managed to flip a forgotten shopping mall into the civil nerve-centre of Surrey.

"People liked to work with Bing," says Heeney, "because of his sense of collaboration." And yet, if the late Bing Thom was patient and preferred to collaborate, he was always chasing time too. "One of the regrets most of us have," says Cheng, "is that Bing worked all of his life to get where he is. A lot of doors were just starting to open for him." Because of Thom's lofty goals, he built very few buildings — far fewer than most architects of his stature. Though as Cheng points out, to have erected a global reputation on the basis of so few projects is a considerable achievement in its own right.

To establish a career as a designer of performing arts theatres demands time, Cheng says. "It's an art not a science," says Cheng. "Lots of performing art theatres don't actually perform."

By all accounts, UBC's Chan Centre solidified Thom's reputation, in part, because of its acoustics. Some musicians, even famous ones, liken its vaulted acoustics to a gargantuan string instrument, with harmonics resonating outward.

As Yo Yo Ma once wrote, addressing Bing Thom: "Great to play in your glorious instrument."

JOHN FRIEDMANN

URBAN PLANNING PIONEER AND HONOURARY UBC PROFESSOR

The UBC Faculty of Applied Science mourns the passing of John Friedmann, 91, an honourary professor in UBC's School of Community and Regional Planning (SCARP).

Also a professor emeritus in the Luskin School of Public Affairs at the University of California, Los Angeles, where he served as head of the Urban Planning Program in the university's Graduate School of Architecture and Urban Planning for many years, Friedmann played a pivotal role in planning scholarship and education for over four decades.

"I consider John Friedmann [to be] the father of our urban planning department," said Anastasia Loukaitou-Sideris, associate dean of the UCLA Luskin School of Public Affairs, "a huge figure whose vision has guided our department's structure, overall mission and social justice goals."

Born in Vienna in 1926, Friedmann left Europe for the United States at the age of 14. After earning a PhD in planning at the University of Chicago in 1955 and teaching stints at the Federal University of Bahia, Brazil (1956-58), MIT (1961-65) and the Pontifical Catholic University of Chile (1966-69), he joined UCLA in 1969 and remained there until his retirement in 1996.

"His work has challenged generations of planning scholars, educators, students and practitioners to reveal their normative stance, rethink their explanations, create visions of good cities, and link knowledge to action for a more humane and just world," wrote Mike Douglass, a professor at the National University of Singapore, in the *Journal of Planning Education and Research* last year.

"[H]IS IDEAS ON REGIONAL DEVELOPMENT, WORLD CITIES, PARTICIPATION AND EMPOWERMENT, AND THE IMPORTANCE OF CIVIL SOCIETY IN RELATION TO PLANNING AND GOVERNANCE HAVE BEEN EXTREMELY IMPORTANT IN THE EVOLUTION OF IDEAS ON PLANNING IN BOTH THE DEVELOPED AND DEVELOPING WORLD."

Friedmann authored or co-edited more than 25 books and wrote over 150 chapters, articles and reviews on topics such as regional development planning, transactive planning, social learning and the world city hypothesis – work that has been cited over 50,000 times. His numerous recognitions include a Guggenheim Fellowship, the Order of Bernardo O'Higgins (conferred by the President of Chile), the Distinguished Planning Educator Award from the Association of Collegiate Schools of Planning and the United Nations Human Settlements Lecture award.

Dubbing Friedmann "the epitomic progressive planner," the United Nations stated that "[h]is ideas on regional development, world cities, participation and empowerment, and the importance of civil society in relation to planning and governance have been extremely important in the evolution of ideas on planning in both the developed and developing world."

In addition to his honourary professorship at UBC, Friedmann held honourary positions at the University of Melbourne and the National University of Taiwan. He received honourary doctorates from Dortmund Technical University, the Pontifical Catholic University of Chile and York University, and advised the governments of Brazil, Venezuela, Chile, Mozambique and China, where he was appointed Honorary Foreign Advisor to the China Academy of Planning and Urban Design.

John Friedmann is survived by his wife, Leonie Sandercock, a professor at SCARP; his daughter, Manuela Friedmann; and his brother, Martin Friedmann. The BC and UBC flags (at the North Plaza of the Old Student Union Building) were lowered in Friedmann's memory on June 14, 2017.

CHEMICAL ENGINEERING 1966 - 50TH REUNION
September 21 to 23, 2016

The 1966 Chemical Engineering class held its 50th anniversary reunion from September 21 to 23. The class' seventh reunion since graduating was based at the Granville Island Hotel; activities included a beer night for the grads, a dinner for the spouses, lunch on campus, dinner at the hotel and breakfast at the 'Off The Tracks Bistro' on the Island. The photo was taken during the lunch at the new Engineering Students Centre, a recommended venue for reunions, and includes Dr. Englezos, Chemical and Biological Engineering Department head, and retired Chemical Engineering professors Dr. Epstein, Dr. Branion and Dr. Wilkinson (all of whom still have an office on campus). Sadly missing from the photo, as they are no longer with us, are Ron Nicholson, Morris Mennell and Marlene Gosling. Marlene, the only female among the nearly 1,000 engineering students in 1966, passed away in June 2016.

Submitted by Peter Hemmes, CHML '66

CHEMICAL ENGINEERING 1956 - 60TH REUNION
September 22, 2016

On September 22, five Chemical Engineering graduates from the class of 1956, accompanied by their wives, met at the Chemical and Biological Engineering Building where Dr. Englezos made an interesting presentation that provided insight into how large and varied the department had grown in the 60 years since the group graduated. The graduates were very impressed by all that they saw in the building and couldn't help comparing with the facilities that they had left behind in "The Pit" in the basement of the old Chemistry building on Main Mall. There was much talk and reminiscing supplemented with excellent food and wine. All agreed that the reunion had been successful.

Submitted by Bob Kendrick, CHML '56

ENGINEERING PHYSICS 1956 - 60TH REUNION
September 30 and October 1, 2016

The 1956 Engineering Physics class held its 60th reunion at UBC. Six of the original nine members of our graduating Engineering Physics class (and some family members) attended. We have met as a group fairly regularly since 1996, when we held our first UBC reunion since graduating in 1956.

The UBC part of our reunion was held Friday, September 30. We met for coffee in the Hennings Building and I felt a thrill as I walked by Hennings 200, site of my first UBC Physics class way back in 1951! Coffee was followed by a wonderful tour of Engineering Physics undergraduate project classrooms, given by Dr. John Nakane and Bernhard Zender. Finally, we met for lunch at UBC's Sage Restaurant. On Saturday, October 1, we toured the BC Sports Hall of Fame at BC Place, Vancouver. We especially enjoyed seeing display photographs which include Michael Harris, a member of UBC's 1956 gold medal winning rowing team.

Overall, I think and hope that this was a wonderful reunion for all; we feel fortunate to have been part of this close-knit group. We hope for more reunions!

Submitted by Peter Riley, Eng Phys '56

BACHELOR OF NURSING 1966 - 50TH REUNION
September 9 and 10, 2016

The BSN Class of 1966 met for their 50th reunion in Vancouver on September 9 and 10, 2016. Once we recovered from the shock that one half century had passed since we crossed the stage in UBC's War Memorial Gym on our graduation day, we began our celebrations!

We gathered at the Sylvia Hotel in an eighth-floor hospitality suite, arranged by our organizers Diane Hick and Jackie Rohan, who did an incredible job. The UBC School of Nursing and the Applied Science Alumni Relations supplied each of us with mementos to mark the occasion.

Nineteen of our class of 29 were able to attend and we shared notable events in our lives since we last met 10 years ago. The energy was palpable and our senses of humour were definitely intact! It struck us how much wisdom and life experience we had accumulated as well as the enormity of our contributions to nursing and to health care. The majority have now retired from their nursing and health care positions. However, it was clear that the knowledge and skills that we acquired during our years of nursing and health care endeavours are being pressed into action as we spend time with family and friends, adjust to changes in our personal lives and undertake community projects. Our lives are enriched by pursuing new interests and acquiring new skills.

We invited a special guest, Dr. Suzanne Campbell, [former] director of the UBC School of Nursing. Suzanne seemed fascinated by our stories and joined us for a delicious dinner in a private dining room at the Sylvia. She gave us a brief synopsis of the accomplishments of the School, faculty and students and also informed us about the newer developments in the undergraduate and graduate programs. We were also taken by the change in nursing education technologies and approaches since our UBC exposure years ago.

The next day saw many of our classmates, along with spouses, meeting for brunch, again at the Sylvia. There was no shortage of energy when sharing more stories, despite our previous late evening. We concluded that the event was a huge success and that we want to come together again, perhaps in two years and at the same venue.

Submitted by Linda Leonard, BSN '66

BSN 2006 - 10TH REUNION
November 19, 2016

Saturday, November 19, 2016, the UBC Nursing class of 2006 met at the Coast Plaza Vancouver to celebrate ten years as nursing graduates. Graduates came from afar to meet and reminisce about their times in school. It was also a wonderful opportunity to learn about what each grad had achieved since completion of nursing school. There is really no limit

to the amazing accomplishments of the group and all left with a warm feeling of reconnecting with friends.

Submitted by Leanne Bulmer, BSN '06

MINING ENGINEERING 1977 – 40TH REUNION
March 24, 2017

The Mining Class of 1977 met in the Robert H. Lee Alumni Centre for coffee and treats; it gave us a chance to catch up and share a bit of history with each other before wandering across campus to the Kaiser Building to see Dean Marc Parlange.

A couple more of the "Magnificent Seven" managed to join us for dinner on Saturday night, along with a couple of Mining Department professors: from the past, George Poling, who guided our class through our shenanigans and mysteries of mineral processing, and from the present, Malcolm Scoble, who both knew Blue Evans in his final years and has worked hard to maintain the intimacy in the department that we had the privilege of enjoying.

Submitted by Alf Hills, MINE '77

MECHANICAL ENGINEERING 1977 – 40TH REUNION
June 23, 2017

We were very impressed with the tour, discovering the high level of technology that has developed since we graduated with only slide-rules and basic calculators in our last year. The cutting edge of robotics using hologram programming awed us all. We thought the integration of course theory into projects was a brilliant idea instead of graduating only with a lot of theory — far more practical. The alumni group filled in all the blanks in order to coordinate the day for us. With the cooperation of the weather, we thought the Ideas Lounge venue and the food were excellent.

Submitted by David Spears, MECH '77

MECHANICAL ENGINEERING 1987 – 30TH REUNION
July 14 and 15, 2017

Club Mech '87 celebrated our 30-year reunion with a pub night on campus, a round of golf and a dinner cruise. Over 30 of us met on Friday night (grads only) at Mahony & Sons, where we shared appies, bevies and stories. We wandered off along West Mall, assessing the new additions to the campus since our time; most of them met our approval and some were astounding! We were very happy to see the old Barn successfully persist but missed the Old Cheez. We stood around the plaza where the Cheez used to stand and reminisced about our exploits on and off campus.

We had so much fun reconnecting with each other that we decided we need to meet more frequently. So, we now have annual pub nights in the works. If you are on our reunion list, watch for the announcements. If you would like to be added to our list, let one of us know!

Submitted by Katherina Tarnai-Lokhorst, MECH '87

1958 UBC Engineering Class: 59th reunion lunch
September 28, 2017

BACHELOR OF LANDSCAPE ARCHITECTURE '92-94
September 29 and 30, 2017

The UBC Landscape Architecture 25 'ish' Year reunion included alumni from graduating years 1992, 1993 and 1994. We had a great turnout with classmates making the trip from Switzerland, California, Calgary, Whistler, the Caribou, Vancouver Island and from every corner of the Lower Mainland. Patrick Mooney led the group on a tour of the new studio and we were able to see how the program has changed and developed over the years. We were entertained with a slide show of photos from our studio years — no, we have not changed a bit — as well as by a few fellow alumni who gave presentations on what mischief they had gotten up to over the last 25 years. A fantastic dinner followed at Sage Bistro. The party carried on at Koerner's Pub where many growlers were enjoyed by all. On Saturday, a few more souls gathered at Sue and Hugh's house for a catered Southern BBQ — it was a relaxing time where we swapped stories and generally rabble-roused, which even included a book signing by Moura Quayle. Everyone agreed we would plan another reunion sooner than later! We are lucky to have graduated from such a creative and inspiring program — our small but close knit group will always celebrate the bond of being a UBC LARC.

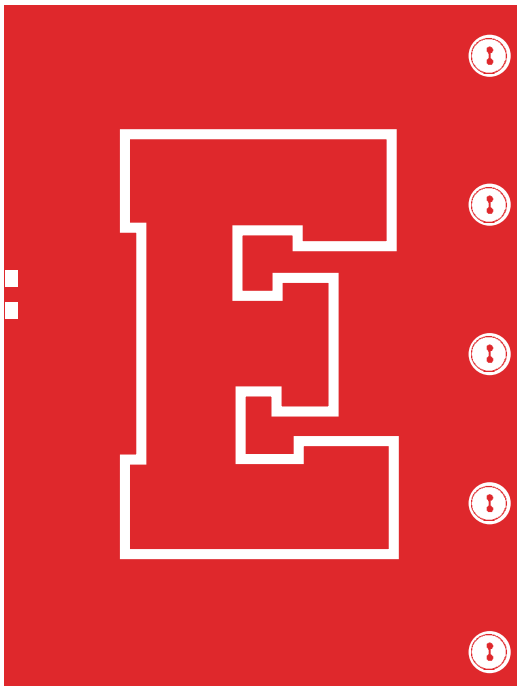
UPCOMING REUNIONS

BSN '58	ENG '78
ENG '58	CHML '93
MECH '68	

WALTER GAGE BOOK LAUNCH
"THE AGE OF GAGE: UNTOLD STORIES OF HOW ONE CANADIAN SHAPED THE LIVES OF THOUSANDS"

You knew him on UBC campus as Dean Gage and later, President Gage. He touched many of us as a math professor and then as the person in charge of running our entire university. The "Friends of Walter Gage" were committed to recognizing his lasting impact on the lives of so many, and to honour his legacy by publishing a book entitled *The Age of Walter Gage: How One Canadian Shaped the Lives of Thousands* with memorable stories and anecdotes, photos and a biographical summary of his exemplary life.

To order the book, visit:
waltergagebook.engineering.ubc.ca



ENGINEERING '78 – 40TH REUNION

Friday, October 19, 2018
11:00 am - 3:00 pm
Robert H. Lee Alumni Centre

We are excited to announce that the 40th reunion of the entire UBC Engineering class of '78 will be held the weekend of October 2018!

A number of individual departmental reunions will take place around the main event, so watch for further updates and stay in contact with the organising committee.

To stay up to date on all of the happenings and see who'll be attending please join the private Facebook group page: "UBC Engineers '78 Reunion."

The committee is looking for additional volunteers to assist with the planning and implementation. If you are interested, please get in touch via the reunion Facebook group or email alumni@apsc.ubc.ca.

Committee members:
Doug Dean (Chair) (BASc '78 ENPH, PhD '85 ELEC)
Barb Dabrowski (BASc '78 CIVL, MASc '81 CIVL)
Fred Dennert (BASc '78 ELEC)
Larry Sunnus (BASc '78 CIVL)

UBC School of Nursing

ALUMNI & PARTNERSHIP AWARDS GALA

May 3, 2018 @ The Robert H. Lee Alumni Centre

This annual event is our opportunity to thank all of our alumni and supporters who have made a deep and lasting commitment to nursing education, teaching and research. We will be presenting a number of awards — the Award of Distinction, the Alumni Recognition Award, the Young Alumni Award and the School of Nursing Partnership awards — to celebrate the special contributions and achievements of our colleagues.

THE UNIVERSITY OF BRITISH COLUMBIA
School of Architecture + Landscape Architecture

MARGOLESE NATIONAL DESIGN FOR LIVING PRIZE

ANNE CORMIER

2017 RECIPIENT

PRIZE PRESENTATION EVENT
MARCH 26, 2018
6:30pm
UBC Robson Square

For more information visit apsc.ubc.ca/events

The Feedback Loop:

with Pharmaceutical Innovator Doug Dean

Likening a career in bio-engineering to one's mountaineering habit may seem a little off track. Yet UBC alumnus Doug Dean (BASc '78 ENPH, PhD '85 ELEC), now retired and living in Switzerland, considers his career and certain risks along the way.

What is the riskiest thing you've done?
Three things are tied: 1) having kids; 2) joining Philip Morris International; 3) in a storm, climbing solo the North Face of Great Trango Tower in Pakistan.

What is your idea of the perfect innovation?
Something unanticipated that solves a significant problem.

What makes a challenge interesting?
Uncertainty of the outcome.

What went through your mind on your first mountain climb?
How are we going to get down? (I was four.)

Who's your favourite mountain climber?
Bill March, one of the fathers of modern ice-climbing.

What is your greatest fear when trying to be innovative while working in a large group?
Trying presupposes failure. My greatest concern is that people will hold back ideas because they lack self-confidence.

What career success or innovation are you most proud of?
Jointly with my wife, Fran, "Method for production refactoring of a producing entity" (Patent US20060259308). A practical application of some really sophisticated math.

What do people often overlook when attempting to reach a goal?
That multiple failures are likely before success.

What quality when you were younger would you most change if you could?
Excessive self-confidence.

Would you ever give away an innovation of yours for free?
Yes.

If your career were a question, what would that question be?
What does the client need?

Would you rather have a highly original or highly useful idea?
Neither. I'd prefer highly profitable.

What's the most difficult thing about managing thousands of people working towards a single goal?
Focus.

What do you remember most about your days in UBC engineering?
The nurses.

What do you most value in a collaborator?
Tenacity and a non-proprietary attitude.

Name one innovator who would not, by conventional standards, be considered an innovator at all.
Hidekazu Tojo, the best *itamae* on the planet.

What is the personal trait you wish your career had better made use of?
I used them all to the max, but wish I had been less tolerant of incompetence.

What part of your own mind or imagination contributes most to your inventiveness?
The confidence to surround myself with people who are smarter and better than me.

If you had a motto, one that followed your name everywhere it went, what would that motto be?
What's next?

MEL
Master of Engineering Leadership

MEL
Master of Engineering Leadership

MEL
Master of Engineering Leadership

A YEAR *can* CHANGE EVERYTHING

MHLP
Master of Health Leadership and Policy

Invest in your career

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