alumni UBC
Trek
A PUBLICATION OF ALUMNI UBC · FALL 2018

ALL THE CONDITIONS NECESSARY FOR **MURDER** ARE MET IF YOU SHUT TWO MEN IN A **CABIN** 18 FEET BY 20 MEASURING AND LEAVE THEM **TOGETHER** FOR TWO MONTHS.

UBC ROCKET'S **MOTTO** IS A QUESTION: "WHAT COULD GO WRONG?"

YOU SITT IN THE **CAPSULE** FOR AN HOUR AND A HALF BEFORE LAUNCH. I NOTICED HOW EVERYONE WAS SO CALM. WE ALL HAD SPECIFIC THINGS TO DO AND WE DID THEM. **THEY WEREN'T PAYING US TO BE AFRAID.**

SPACE TOURISM

IS A PROMISING AREA; WE DON'T WANT TO WRECK THE **SEVEN WONDERS** OF THE **NEAR-EARTH WORLD** BEFORE **PEOPLE** HAVE A CHANCE TO ENJOY THEM AND LEARN FROM THEM.

YOU REMEMBER IN **STAR WARS** WHEN C-3PO MAKES A **DIRE PREDICTION** ABOUT THE ODDS OF FLYING THROUGH AN ASTEROID BELT? IT'S ACTUALLY VERY HARD TO HIT AN **ASTEROID.** ONCE SAID THERE'S A LOT OF **SPACE** IN SPACE, AND HE'S **RIGHT.**

BILL NYE

LUNAR DUST IS VERY FINE, ALMOST LIKE TALCUM POWDER. IT HAS A DISTINCTIVE SMELL – SORT OF A COMBINATION OF GUNPOWDER AND ASHES. THERE WAS A SMALL CLOUD OF DUST ON BOTH SUITS, WHICH I GOT IN MY NOSE AND MY EYES. IT WAS VERY IRRITATING.

HOW MANY KIDS (OTHER THAN **NEIL'S**) CAN BOAST THAT THEY PLAYED **"MARCO! POLO!"** WITH THE **FIRST HUMAN** TO LEAVE **BOOTPRINTS ON THE MOON?**

IN REMOTE, UNFORGIVING LOCATIONS, WE BECOME MORE AWARE OF OUR COMMON HUMANITY.

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Correction, Spring 2018
The spring 2018 issue of Trek magazine included an image of Dr. Gordon Matheson on page 36, who was incorrectly identified as Dr. Chan Gunn. We apologize to both Dr. Matheson and Dr. Gunn (who is pictured here, left, with UBC's President Ono). Dr. Gunn is a Vancouver physician known for his innovative work in the field of pain relief. He generously donated $5 million to the Faculty of Medicine to support the construction of the Chan Gunn Pavilion, a facility focusing on physical activity and exercise medicine that opened in March.

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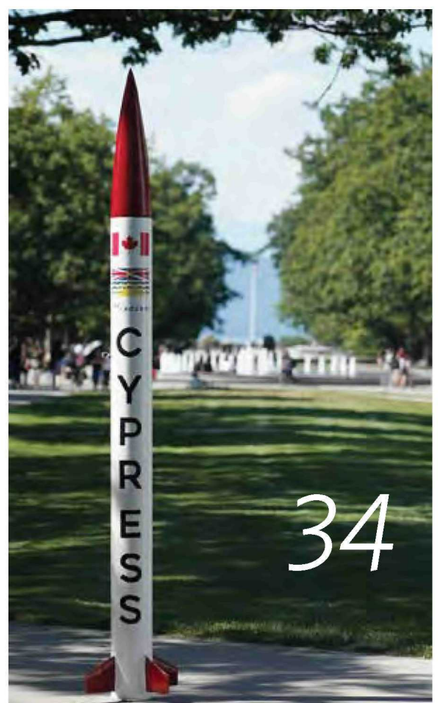

From the Moon to Mars

I was two years old when Neil Armstrong walked on the surface of the Moon. When an estimated half a billion people were watching mankind's giant leap – a miraculous feat of science, engineering and bravery – I was probably asleep (or bawling).

I've grown up in the Space Age, never conscious of a time when humans couldn't leave Earth (well, a few of them anyway – for a finite time), but my parents and grandparents, let alone the generations before them, probably thought the idea of walking on the Moon an impossible dream.

Now we're talking colonies on Mars and the tantalizing notion of habitable planets beyond our solar system. Much like the Moon 50 or 60 years ago, it all seems far beyond reach.

But human beings are hardwired to explore and usually make it to their destination, or find ones they weren't expecting. Throughout history, people have taken risks to explore the unknown, and through a combination of ancient wisdom and ingenuity have reached most places on their own planet that can sustain human life – in order to settle, find new land, map, conquer, explore, survive, research, or profit. An intrepid few have even made it to the extremes of Earth that can't sustain human life – from the floor of the Mariana Trench to the summit of Everest, and from North Pole to South. It seems we're helplessly drawn to cold and inhospitable places.

Is it possible we can set up colonies on Mars and other planets yet to be discovered? The explorers of the past could never have foreseen where we are today. We can't foresee the future either, but the compulsion to explore and learn defines us as a species. NASA has spoken of people orbiting Mars by 2030, shortly followed by a landing, with commercial enterprises predicting they will do it sooner. Whoever gets there first, the moment we become an interplanetary species will be watched live by billions of astonished people on Earth. And this time, I'll be awake for it.

Vanessa Clarke
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Gino DiLabio

Powerful artificial antioxidant

Naturally-derived antioxidants have become the "it" health ingredient to look for in food. But researchers from UBC Okanagan and the University of Bologna have discovered that TEMPO – a well-known artificial antioxidant – is up to 100 times more powerful than nature's best and could help counteract everything from skin damage to Alzheimer's disease.

Free radicals are highly reactive molecules that are naturally present in the body and are created during routine natural processes like breathing, according to UBC chemistry professor and study co-author **Gino DiLabio**.

"Free radicals are a natural part of human metabolism. But when our bodies have too many, like when we're exposed to UV radiation from the Sun, when we smoke, or even when we drink alcohol, it can be a problem," says DiLabio. "These extremely reactive molecules can damage cells or DNA and can contribute to many different diseases, like Alzheimer's, and some researchers think they may even be responsible for aging."

While the body already has its own chemical defenses against free radicals through vitamin C and vitamin E, DiLabio and his colleagues wanted to know how a human-made antioxidant called TEMPO would perform.

To explore the idea, the researchers used a mimicked cell environment to test how effective TEMPO was in converting free radicals to non-harmful molecules compared with vitamin E.

"We were surprised to learn that TEMPO was up to 100 times faster at converting free radicals than vitamin E in fatty environments," says DiLabio. "That means that it could be a particularly effective means of protecting skin tissues or even the walls of cells from radical damage."

Dilabio says that the study may lead to the development of a pharmaceutical therapy to help prevent free radical damage.

"I could see this leading to the development of a topical cream to protect your skin after exposure to the Sun or even a pill that could protect your neurons from getting damaged. The possibilities are very exciting."

Does child abuse leave "molecular scars"?

Children who are abused might carry the imprint of that trauma in their cells – a biochemical marking that is detectable years later, according to new research from UBC and Harvard University.

The findings, based on a comparison of chemical tags on the DNA of 34 adult men, still need confirmation from larger studies, and researchers don't know if this tagging – known as methylation – affects the victims' health.

But the difference in methylation between those who had been abused and those who had not – if it is replicated in larger studies and can be described in greater detail – might one day be useful as a biomarker for investigators or courts in weighing allegations of child abuse.

"Methylation is starting to be viewed as a potentially useful tool in criminal investigations – for example, by providing investigators with an approximate age of a person who left behind a sample of their DNA," says senior author **Michael Kobor**, a medical genetics professor at UBC who leads the "Healthy Starts" theme at BC Children's Hospital Research Institute. "So it's conceivable that the correlations we found between methylation and child abuse might provide a percentage probability that abuse had occurred."

Methylation acts as a "dimmer switch" on genes, affecting the degree to which a particular gene is activated or not. Scientists are increasingly looking at this turning on and turning off of genes, known as epigenetics, because it's believed to be influenced by external forces – a person's environment or life experiences.

The researchers decided to look for methylation in sperm cells, on the premise that childhood stress might inflict long-term physical health effects not only on the immediate victims, but also on victims' offspring, as demonstrated in previous animal experiments.

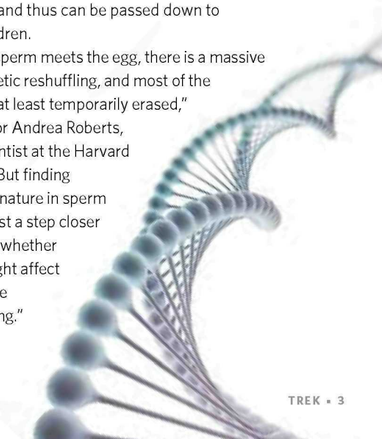
They identified a group of men who are part of a much larger, long-term health tracking study coordinated by Harvard's T.H. Chan School of Public Health, and asked them to donate their sperm. In detailed questionnaires they had completed years before, some of the men said they had been victims of child abuse.

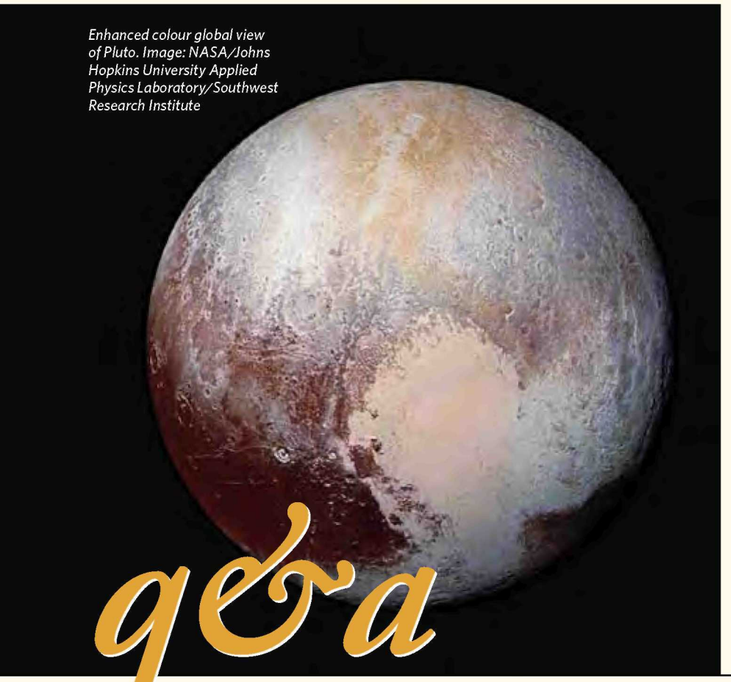
The researchers found a distinctive methylation difference between victims and non-victims in 12 regions of the men's genomes.

The scientists were struck by the degree of "dimming" in those dozen regions: Eight DNA regions were more than 10-per-cent different, and one region showed a difference of 29 per cent.

The study does not demonstrate long-term physical consequences of child abuse, because it's still unknown how methylation of those genetic regions affects a person's health. In addition, scientists don't know if methylation patterns survive the messy process of fertilization and thus can be passed down to a person's children.

"When the sperm meets the egg, there is a massive amount of genetic reshuffling, and most of the methylation is at least temporarily erased," says lead author Andrea Roberts, a research scientist at the Harvard Chan School. "But finding a molecular signature in sperm brings us at least a step closer to determining whether child abuse might affect the health of the victim's offspring."





Enhanced colour global view of Pluto. Image: NASA/Johns Hopkins University Applied Physics Laboratory/Southwest Research Institute

q&a

How planets play ping-pong

By Silvia Moreno-Garcia, MA'16

Christa Van Laerhoven, *BSc'07*, is a UBC astrophysicist and post-doctoral fellow who studies celestial mechanics, which she says is a fancy name for orbital shenanigans. After completing a PhD at the University of Arizona she is now back in BC and often involved in public science engagement events around the province. She talks about Neptune, exoplanets, and what science fiction writers get wrong.

Why are you so interested in the Kuiper Belt?

The Kuiper Belt is a ring of small objects extending just beyond the orbit of Neptune from about thirty to hundreds of astronomical units (AU). Everyone gets upset, because Pluto is not a planet, but it's a Kuiper Belt object, which I think is more interesting. And the Kuiper Belt can tell you so much about the formation of the Solar System, much more than the planets. It shows you how Neptune migrated.

Wait, Neptune migrated?

Yes! Kuiper Belt objects are like little ping pong-balls that the planets bat around. Imagine you're on a frictionless surface like an ice sheet, and you started batting thousands of balls from one side of you to the other side of you. You'll start to slide. This is how Neptune migrated. It took things from the Kuiper Belt, threw them around. When Neptune throws objects in, Uranus can get a hold of them and take them away, handing them to Saturn. So when Neptune pulls objects in, it tends to lose them, and when it throws stuff out they come back. As Neptune does this, it plows through the Kuiper Belt and messes with all the objects in there.

If you look just at Neptune in isolation, it can't tell you that story. It can't tell you it used to be at a different distance from the Sun, closer to it than it is today.

You also study exoplanets, planets beyond our solar system.

I like thinking about the long-term orbital evolution of exoplanets. I'm a panelist on Reddit's Ask Science, and a couple of years ago a user asked: "How many planets can you fit in a habitable zone?" And I went through the literature and nobody had quite done that calculation. So we generated several hypothetical systems, and the answer is five. You can fit five Earth-massed planets in the habitable zone, which is the range at which planets could support liquid water and life. In most science fiction you see one or two habitable planets in any given system, but you can have more.

What else does science fiction get wrong about space?

The thing that is jarring is how they treat asteroid belts. You remember in *Star Wars* when C-3PO makes a dire prediction about the odds of flying through an asteroid belt? It's actually very hard to hit an asteroid. Bill Nye once said there's a lot of space in space, and he's right. If we launch a mission to Jupiter, a layperson might stop to worry about whether an asteroid might hit us. But unless you're aiming for one, you won't hit it.

Mission to Mars

NASA launched its Mars InSight lander from California on May 5 – the first interplanetary launch from the Vandenberg Air Force Base – and it is expected to reach its destination in late November. Sending a lander to Mars will allow researchers to peer inside the planet and learn about what's below the surface, as well as the planet's history. UBC planetary scientist **Catherine Johnson** is the only researcher from Canada involved in the mission.

What makes this mission unique?

The mission is the first time we will deploy a seismometer on the surface of another planet. Astronauts installed seismometers on the Moon as part of the Apollo missions, but InSight is the first mission to put a seismometer on another planet's surface. The seismometer will tell us where and when "marsquakes" (earthquakes, but on Mars) occur and provide a look at Mars' interior.

What is your role in this experiment?

I'll be involved in studying marsquakes. We want to know where marsquakes occur geographically and at what depth, to try and understand where there are active faults.

A big part of what we'll be doing is working with data returned from the magnetometer. This is the first time an instrument that measures the magnetic field will be deployed on the surface of Mars. We'll hope to get some information about the magnetization of rocks near the surface and perhaps more importantly, to be able to measure the magnetic field and how it varies over time, for example, between day and night. Those variations might be able to tell us how electrically conductive the rocks in the interior of the planet are and, in turn, help us understand the composition and water content of those rocks.

This will be an important experiment to try and understand the history of water on the surface of Mars. We'd like to know how much is tied up in the interior of Mars to understand the water inventory of the planet.

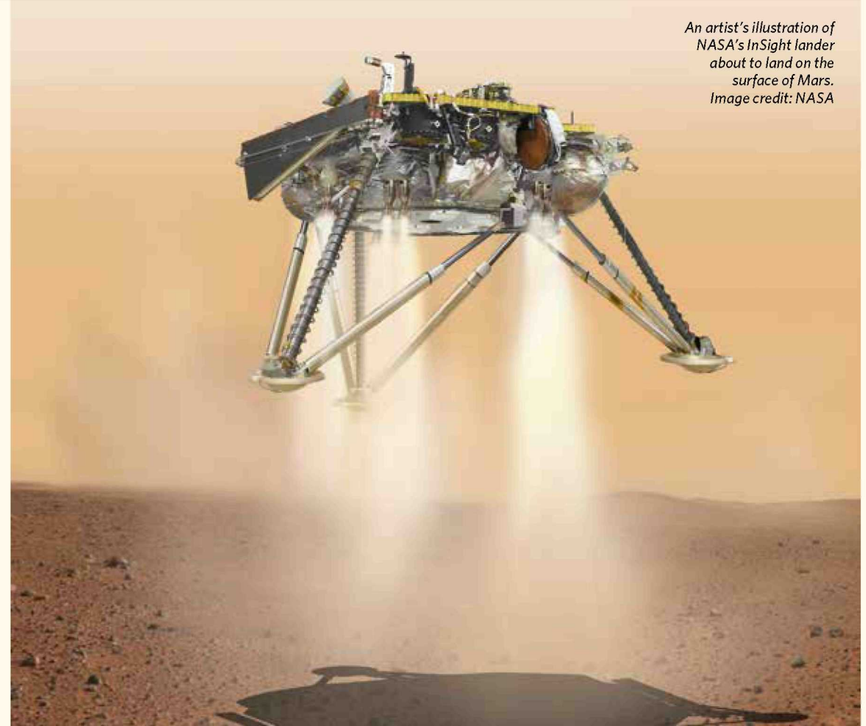
How will we use this information to understand the planet's history?

We know from surface measurements from Mars Rovers and from images and satellites we've had in orbit for the last couple of decades that the planet's early history was a very different place than it is today. Surface water and ice were much more abundant and the atmosphere was much thicker.

The big question is where did the water come from and where did it go? We know the history of water on the planet's surface and in its atmosphere, but we don't know about the interior and how much water is tied up in rocks inside Mars. Understanding the water content in the interior of the planet is a key part of being able to understand the history of water.

It's also important for comparative studies to better understand how much a planet changes during its history. Very early in its history, Mars went through the same general processes as Earth-heavy materials (metals) sank to the center to form the iron core, and rocks, which are lighter "floated" on top forming the crust and the mantle.

Mars, like Earth and Venus, is a rocky planet but it isn't as large, so it has undergone less reworking from its interior to its exterior over time. It has had tectonics and volcanism like Earth and Venus but the record of early processes should still be seen in its interior structure. By looking inside Mars, we hope to get a window into the early processes that all these rocky planets have experienced.



An artist's illustration of NASA's InSight lander about to land on the surface of Mars. Image credit: NASA

Yanwen Wang

Negative advertising works in US politics

By Tom Leslie

New research from the UBC Sauder School of Business has found that negative political advertising is effective, especially if it's coming directly from a candidate or their campaign. Meanwhile, positive advertising, or ads from organizations such as Political Action Committees (PACs), is far less effective.

In this Q&A, **Yanwen Wang**, study co-author and assistant professor at UBC Sauder, explains how the study – the first of its kind – was carried out and why the findings are important.

Her co-authors are Michael Lewis and David A. Schweidel of Emory University.

Why did you want to study political ads?

With the millions of dollars being spent on advertising in the lead up to midterm and presidential elections, we wanted to try to understand the role that advertising plays in the outcomes, especially when it comes to PACs, because that is where the vast majority of the advertising spend is coming from.

How did you conduct the study?

We examined political advertising and its impact on the share of the vote during the 2010 US midterm election and 2012 US presidential election campaign. Our focus was on advertising across the borders of designated marketing areas (DMAs), a term used by marketers to define marketing areas by town, city or major metropolitan area.

People within the same electoral area that live on different sides of a DMA border are fairly similar, but they get selected into different exposure levels of political advertising. For example, you and I could live across a road from each other but we belong to different media markets, and we would get exposed to totally different TV advertising.

What did you find?

The key finding was that advertising dollars spent by PACs were much less effective compared to advertising by the candidates, and negative ads performed very well.

We looked at vote share and turnout rates. We found candidates' own advertising is effective in lifting the vote share as well as mobilizing turnout. In fact, negative advertising from candidates was approximately twice as effective as advertising sponsored by PACs. PAC advertising was only slightly effective in affecting vote shares, and not effective at all in mobilizing turnout rates.

Why do you think PAC advertising is less effective?

We believe it is due to differences in source credibility across the various ad sponsors. Basically, advertising by PACs may lack credibility in the eyes of audiences. You would expect that, given the amount of money they were spending, that PAC ads would be more polished and professionally produced, but based on my experience, this was definitely not the case. And while the tone of candidates' ads were usually very professional, the PACs ads came off as funny, aggressive, or a bit illogical.

Nanotechnologies and Opioid abuse

New research at UBC's Okanagan campus, Harvard Medical School and the University of Texas is exploring the role nanotechnologies can play to reduce opioid abuse.

Sepideh Pakpour, an assistant professor at the School of Engineering, says nanotechnologies can help address drug addiction by identifying the most at-risk individuals – those who are physiologically predisposed to be affected by opioids – and help develop new therapeutic targets and personalize appropriate treatments.

"Owing to the unique and diverse properties of nanotechnologies, they offer enormous opportunities when it comes to innovative scientific approaches to understanding addiction," Pakpour says.

Nanotechnologies are extremely small devices that can do anything from monitoring neurotransmitters in the brain to enabling more sensitive drug testing and blood plasma monitoring. Pakpour explains nanotechnologies have already found widespread applications within life sciences, including targeted delivery of therapeutic biomolecules, contrast agents to monitor cancer cells and tumour binderies, hyperthermia, immunotherapies, and tissue engineering applications. However, their potential applications for opioid abuse diagnostics, drug detoxification, opioid dependence and addiction treatment remains untapped.

According to the new research, the speed and accuracy of nanotechnologies can result in a more effective approach in drug development and identification, along with better screening of patients who may be vulnerable to addiction. Theoretically, Pakpour says, nanotechnologies can enable researchers to improve their understanding of multiple addiction variables at the molecular level.

Nanotechnologies can be designed to regulate brain-signalling pathways that are associated with drug addiction," explains Pakpour. "And nanoparticles can be used to detect protein and microbial biomarkers in a person's plasma, urine or saliva for successful and robust identification and discrimination of vulnerable individuals."

With an interdisciplinary research background, Pakpour's work bridges biology with engineering and her research group models how human microbiome interactions impact disease.

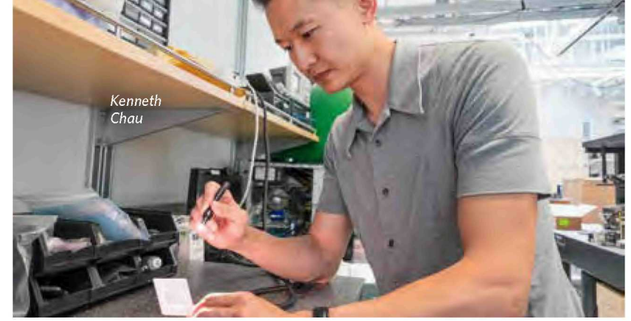
"With the help of funding agencies together with collaborations between nanomedicine, human microbiome and drug-abuse experts, we believe that nanotechnologies will provide a unique capacity for both predictive and therapeutic approaches in opioid dependency and addiction in the foreseeable future," she adds.

Enlightening Research

The idea that light has momentum is not new, but the exact nature of how light interacts with matter has remained a mystery for close to 150 years. Recent research from UBC's Okanagan campus may have uncovered the keys to one of the darkest secrets of light.

Johannes Kepler, famed German astronomer and mathematician, first suggested in 1619 that pressure from sunlight could be responsible for a comet's tail always pointing away from the Sun, says study co-author and engineering professor **Kenneth Chau**. It wasn't until 1873 that James Clerk Maxwell predicted that this radiation pressure was due to the momentum residing within the electromagnetic fields of light itself.

"Until now, we hadn't determined how this momentum is converted into force or movement," says Chau. "Because the amount of momentum carried by light is very small, we haven't had equipment sensitive enough to solve this."


Kenneth Chau

Now that technology is sensitive enough, Chau, with his international research team from Slovenia and Brazil, are shedding light on this mystery.

To measure these extremely weak interactions between light photons, the team constructed a special mirror fitted with acoustic sensors and heat shielding to keep interference and background noise to a minimum. They then shot laser pulses at the mirror and used the sound sensors to detect elastic waves as they moved across the surface of the mirror, like watching ripples on a pond.

"We can't directly measure photon momentum, so our approach was to detect its effect on a mirror by 'listening' to the elastic waves that travelled through it," says Chau. "We were able to trace the features of those waves back to the momentum residing in the light pulse itself, which opens the door to finally defining and modelling how light momentum exists inside materials."

The discovery is important in advancing our fundamental understanding of light, but Chau also points to practical applications of radiation pressure.

"Imagine travelling to distant stars on interstellar yachts powered by solar sails," says Chau. "Or perhaps, here on Earth, developing optical tweezers that could assemble microscopic machines."

"We're not there yet, but the discovery in this work is an important step and I'm excited to see where it takes us next."

Novel discovery could lead to new cancer, autoimmune disease therapy

A new discovery by an international research team – co-led by UBC Canada 150 Research Chair **Josef Penninger** and Harvard Medical School neurobiologist Clifford Woolf – could have implications for therapies for cancer and autoimmune diseases.

The researchers outline a new understanding of the biology of T cells, a type of immune cell in the body, that demonstrates how the cells can be activated to either enhance immunity against cancer or block autoimmune disease.

T cells are the soldiers of the immune system and patrol the body seeking out pathogen-infected cells or aberrant cells that could become tumours. When T cells find such a cell, they proliferate and enter "combat mode" to fight danger to the body. However, a common problem is that activated T cells can be directed against the body's own cells, leading to allergic reactions and autoimmune diseases such as colitis, asthma, multiple sclerosis, arthritis, or certain skin diseases.

The researchers found that BH4 – a molecule needed to produce the "happiness hormone" serotonin or dopamine – controls the growth of T cells. In animal models, they found treating mice with BH4 blockers "calmed" T cell activity in inflammatory conditions. Meanwhile, they found that higher levels of BH4 activated growth of T cells, causing tumours to shrink.

"One fascinating feature of our discovery is that a system that was actually known in neurobiology for decades can play such a key role in T cell biology," said study co-author Josef Penninger, the Canada 150 Research Chair in Functional Genetics and new director of the Life Sciences Institute at UBC.

"And since it regulates not only early activation but how T cells grow, the possibilities for medical applications are extremely varied, from controlling autoimmune diseases, asthma and allergies to having a new way to trigger anti-cancer immunity."

As part of the study, the researchers have developed a new drug called QM385, which inhibits BH4 production, which they hope to soon start testing in human patients.

quote UNQUOTE

"People often buy these genetic ancestry tests because they're looking for a sense of belonging or to confirm a story that's been passed down in their family. But if the test results don't support what they want to believe, we found that people will often ignore the results or criticize them. We tend to cherry-pick the parts of our family story that we like most and want to emphasize."

*~ **Professor Wendy Roth**, lead author of research that discovered a tendency to pick and choose regarding the results of genetic ancestry testing.* (UBC News, *June 28*)

"[misconceptions about the sex-ed curriculum often come] from individuals who haven't had factual, age-appropriate sexual health education themselves. Typically, if you address the strongest critics and ask them a few questions, you start to notice a lack of knowledge, and the false notion that kids are going to be 'converted' or drawn into different choices or patterns of behaviour."

*~ Teacher education professor **Wendy Carr** on the importance of sexual orientation and gender identity being part of sexual health education in schools, and what's at the root of protests against it.* (UBC News, *September 6*)

"There is no silver bullet here. You all have your own path that you are going to create. And the whole of your life, you are going to be creating you. I am still creating me even today."

*~ **Dr. Roberta Bondar**, speaking to new graduates at UBC Okanagan after receiving her honorary degree in 2016. Bondar is a physician and scientist who made history in 1992 as the first Canadian female astronaut and the first neurologist in space, aboard NASA's space shuttle Discovery.*

Q: What is the best present you've ever been given?

A: A birthday cake. When I was 11 years old, I said I wanted to have a birthday cake in the shape of the Moon and my mother made me a birthday cake in the shape of the Moon – craters and all – and she also made an Apollo 11 lunar landing module that she put on top of the cake with an American flag.

*~ **UBC president Santa Ono**, in an interview with the* Globe and Mail, *March 1*

"There's no doubt that because of Trump there's increased interest in journalism in the US with more reader-funded media: *The New York Times* increasing its subscriptions. A lot of people donating to journalism organizations. It's been very pronounced in the States. We haven't seen the same kind of trend in Canada."

*~ UBC professor of journalism **Alfred Hermida** in an interview with* Vice News, *Nov 1*

Age of Universe

13.77 billion years

4.6

Percentage of universe made up of atoms

95+

Percentage of universe made up of dark matter and dark energy

Research results from the work of NASA's WMAP team to map the early universe. The team includes UBC profs Gary Hinshaw (a team leader) and Mark Halpern. This important work won the team the 2018 Breakthrough Prize in Fundamental Physics, which comes with a $3 million prize.

93% | 94%

Level of student satisfaction at UBC's Vancouver and Okanagan campuses, based on an Undergraduate Experience Survey.

337,270 in 148

The number of UBC alumni and the number of countries they live in (2017-18).

13,237

Number of UBC degrees granted in 2017

7

Number of artificially intelligent floor-cleaning robots that will be in use at UBC by the end of the year. They were developed by a company founded by UBC grads, who received entrepreneurial support from Innovation UBC.

11,796

+ 2,700 + 1,800

As of September, UBC's Vancouver campus has nearly 12,000 student beds, more than any other Canadian university. Another 2,700 spots will have been added by 2022, and land has been set aside for a further 1800 if required in the future.

n =

The World Famous Physician

How a kid from a Vancouver Island logging town became flight surgeon for Apollo 11.

BY **CHRIS CANNON**

As far as science celebrity goes, little compares with contributing to America's moonshot – the Apollo 11 capsule that touched down on our lunar satellite on July 20, 1969. As flight surgeon for the mission, Bill Carpentier, *MD'61*, garnered a level of historical immortality few achieve in their field.

A pilot and specialist in aviation medicine, Carpentier's resumé seemed tailor-made for attending to astronauts. But it was his swimming prowess, of all things, that set him on the path to becoming "America's most famous doctor."

Soon after arriving at the Manned Spacecraft Centre in Houston, Texas, in 1965, a 28-year-old Carpentier was settling in to finish his medical residency and become a flight surgeon trainee for NASA. With the Gemini program in full bloom, and NASA transitioning from military oversight into a civilian organization, there was no shortage of potential adventure.

One of the spots up for grabs was that of recovery physician for the Gemini capsule. As part of the helicopter crew responsible for snatching astronauts from the water after splashdown, the recovery physician would work with the Underwater Demolition Team (UDT) to address any emergency medical needs – even if it meant jumping into the water and treating the crew in a churning sea. But the physician that had been assigned to the next Gemini mission was not quite up to the task.

"So my boss said to me, 'Weren't you a swimmer in college?'," Carpentier recalls. As luck would have it, he had swum competitively, and underwent scuba training during his residency at Ohio State. "At that point in my life I didn't think there was anybody in the world that was a better swimmer than I was. I said I'm not just a swimmer, I'm a damn good swimmer. He said 'Would you be willing to jump out a helicopter and give medical treatment if needed?' And I said you bet! What could be a better job than that? Yeah, let's go!

"And that's what it was like at NASA in those days. There were jobs to do, there was something to learn. They'd ask, 'Can you do this job?' And if you said yes, then you just did it, and you better do it well."

Carpentier was in the helicopter that hoisted up the Apollo 11 astronauts from the decontamination raft on the sea. He checked their physical condition as they entered the helicopter. Still in his orange flight suit, he was the last one to leave the helicopter when it arrived onboard the USS Hornet and they walked across the hangar deck to enter the MQF for their quarantine. Image credit: NASA

Carpentier was always up for a new adventure. Born in Edmonton, he moved to Vancouver Island in 1945 when his father returned from World War II after five years with the Canadian Army. Facing sparse prospects in Alberta, he resettled the family in Lake Cowichan to work the sawmills and be closer to his brothers.

Despite the smallville atmosphere of a logging town, Carpentier nurtured a deep curiosity about the outside world – particularly the idea of becoming a pilot – more than once considering a career in the military. While studying engineering and physics at nearby UVic, he spent his summers working for the Canadian Pacific Steamship Company, moving from job to job with each new opportunity – mess boy, freight loader, waiter, assistant purser. "I worked for them many summers," he recalls, "because I like going to sea, I like being on the ocean. It was a great job – anything that they had open, I applied for."

Although most of his income went to college expenses, he saved enough for flight training, earning his private pilot's license by taking one-hour lessons in the small window of light left after working a 12-hour shift each day.

His interests eventually turned to medicine, earning him a spot at UBC's medical school. In his fourth year he met Wilma Sloan, a nurse trainee who was also studying at UBC, and by the following summer they were married and off to Ohio State, where Carpentier took up a two-year residency program in aviation medicine.

A researcher at heart, he seemed destined for academia, planning to earn his PhD at McGill University in Montreal. But only months before leaving Ohio, with Wilma already *jusqu'au cou* in French lessons, he received a call with the question of a lifetime. NASA's Manned Spacecraft Center was instituting a third-year training program in aerospace medicine, and would he like to apply.

Shortly after he was assigned as recovery physician for the Gemini capsule, he hit a snag. The US Navy insisted he learn to conduct rescue jumps, and within days he found himself staring into the Gulf of Mexico from a Coast Guard helicopter.

"I said, Would I like to apply?" he recalls. "My god, would I like to apply? I would really, really, really – four hundred times really – want to come down, but I'm on an exchange visitor visa. I don't have a green card."

But four little words on the other end of the phone changed Carpentier's life: "We can fix that."

After six months of investigation by the RCMP, the US State Department, and the FBI, he had his security clearance in one hand and his green card in the other. In January 1965, Bill and Wilma hopped in their little car, and off they went to Texas.

The timing couldn't be better. NASA, only seven years old, was wrapping up the Mercury program that sent the first Americans into space, and with the Apollo missions only four years away, the Moon was as incredibly near as it was incredibly far.

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Carpentier had been told by outgoing flight surgeons that the UDT teams – the predecessors to the Navy Seals – could jump out of a helicopter at 40 knots from 40 feet in the air, and he wanted to prove he was up to the task. The pilot refused, deeming it too risky, but Carpentier insisted. There would be no rescue buddy in the water with him. No life preserver, no scuba gear, nothing but a wetsuit jacket for flotation. He knew that if he had to

go into the water for a Gemini splashdown, he had to be unencumbered to aid the astronauts, and then squeeze himself into a horse collar to be hauled back up to the helicopter. He didn't want an actual rescue mission to be his first time.

The pilot conceded to starting slowly and working their way up: 10 feet high at 5 knots. 15 feet at 10 knots. 20 feet at 15 knots. "At 25 feet I was hitting pretty hard," he remembers. "So I said, 'Look, we're gonna be here all day long, let's just do it. Go at 40 feet and go 30-40 knots and I can say I did it.' So we did it. I jumped out and I hit with a pretty big bang. But I was fine, I lived through it, and they hauled me back up."

When Carpentier later met the UDT team on the aircraft carrier, the senior officer looked down at him and asked, "Have you ever jumped out of a helicopter before?" Carpentier told him he jumped 40 feet going almost 40 knots. The officer looked at him like he was crazy. "You did what!?"

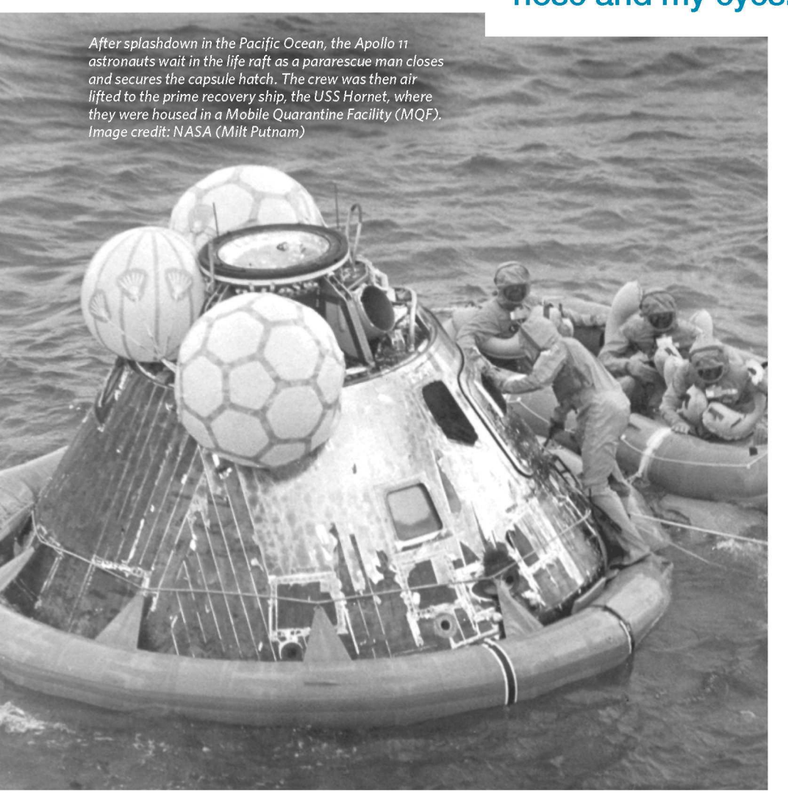
Carpentier had been misinformed. None of the military swimmers had ever made a jump that dangerous. Rescue helicopters usually hover in place at under 20 feet.

But now fully trained for recovery missions, he could settle into his primary role of studying the effects of space travel on human physiology, particularly the little-understood issue of weightlessness. The longest flight so far was Gordon Cooper's 34-hour orbit, but future missions would call for days in space, and the moonshot would take two weeks.

Splitting his time between the lab and the sea, Carpentier alternated between charting the effects of weightlessness on linear graphs and practicing recovery operations on an aircraft carrier, where he trained with the UDT personnel for every imaginable scenario, from hooking up an IV to administering CPR – all on a pliable raft in a six-foot ocean swell.

Carpentier, who can just be made out in the background, joined Armstrong, Aldrin and Collins for the duration of their quarantine in a converted Airstream trailer. Photo: Don Blair

"Lunar dust is very fine, almost like talcum powder. It has a distinctive smell – sort of a combination of gunpowder and ashes. There was a small cloud of dust on both suits, which I got in my nose and my eyes. It was very irritating."



After splashdown in the Pacific Ocean, the Apollo 11 astronauts wait in the life raft as a pararescue man closes and secures the capsule hatch. The crew was then air lifted to the prime recovery ship, the USS Hornet, where they were housed in a Mobile Quarantine Facility (MQF). Image credit: NASA (Milt Putnam)

"I thought to myself, Are they going to be able to make it?" he recalls. "What am I going to do if they are in serious trouble? How am I going to handle myself? What is the worst scenario that I can think of, and what am I going to do about it? When you're that age and in that kind of job, your main concern in life is don't screw up. That was my main concern from the time I got up in the morning till the time I went to bed at night. Don't screw up."

Lucky for all, he never had to put the training into practice; his Gemini assignments all brought back healthy astronauts. As Gemini wound down, he was assigned to pre-flight medical care for the Apollo missions, travelling around the country to monitor the crew as they prepared for the trip of their lives.

Somewhere in the haze, Bill and Wilma managed to have children, both boys, born in 1965 and 1968. Wilma went all-in on her education, earning her undergraduate and master's degrees, and her PhD, during their stay in Texas. It's hard to imagine, even in retrospect, that between the travel, the training, the work, the classes, the marriage, and the diapers, somewhere you had to fit a moon landing into your schedule.

"Zero dark thirty" is what soldiers call it when your alarm goes off and there's not a sliver of light in the sky. On July 24, 1969, – three days after the first human stepped onto the surface of the Moon – Carpentier greeted the wee hours aboard the aircraft carrier *USS Hornet*, ready to fish Armstrong, Collins, and Aldrin from the middle of the Pacific Ocean. The lunar command module splashed down before dawn, and by the time the Sun filled the morning sky, the doctor and his patients exited the retrieval helicopter in full biological isolation suits on their way to over two weeks of seclusion, starting in NASA's Mobile Quarantine Facility (MQF), a converted Airstream trailer.

So as not to accidentally infect the astronauts with any fresh bugs, Carpentier had already spent a week in the MQF with project engineer John Hirasaki, who was responsible for testing the equipment and samples in the spacecraft that had been hauled aboard the ship and attached to the MQF. Carpentier remembers the daily routine as surprisingly businesslike considering what had just been accomplished. Hirasaki packaged the lunar samples and cooked the meals. Carpentier conducted daily exams of the crew and served as bartender.

Carpentier and project engineer John Hirasaki inside the MQF. Image credit: NASA

After caring for the crew, Carpentier's most pressing duty was to swab the inside of the capsule to test for biological contaminants. It was believed the possibility of contagion was remote, but NASA's Committee on Back Contamination had established the Extra-Terrestrial Exposure Law to keep Earth safe from potential outer-space pathogens.

There were none – another lucky break for Carpentier, who accidentally inhaled a lungful of moon dust. "As soon as I opened up the suit bag, I got lunar dust on me," he remembers. "Lunar dust is very fine, almost like talcum powder. It has a distinctive smell – sort of a combination of gunpowder and ashes. There was a small cloud of dust on both suits, which I got in my nose and my eyes. It was very irritating."

After two more days aboard the Hornet, the MQF was flown back to Houston, occupants and all, where they were moved to a larger facility and joined by technicians and support personnel who had sealed themselves in the previous week. The crew had a television, a ping-pong game, a pool table, exercise equipment, and books to pass the time, but their days were dominated by mission debriefings, report writing, medical exams, blood tests, and constant monitoring.

They did not particularly enjoy the confinement, and after eight days in a space capsule, the desire to hold their families and breathe fresh air was understandable. Not even a week into their quarantine, they were asked by the press through a glass wall how they were enjoying their time in the receiving laboratory. Armstrong mustered a sportsmanlike response: "About as well as you can expect." Collins said "I want out."

But it was the calm between two storms. They had just accomplished one of the most significant feats in human history, and the world was not going to let that go without a party. On August 10 the quarantine was lifted, and the astronauts soon embarked on an international "Giant Leap" tour. Carpentier, suddenly a global celebrity, was deemed "famous enough" to join them, and on Air Force One manifests was listed as "WFP" (World Famous Physician).

"That's hard to imagine," says Carpentier, "a kid growing up in the middle of Vancouver Island in a logging camp, flying on the president's airplane with the first guys that walked on the Moon. Going to major cities around the world, going to state dinners and meeting presidents, prime ministers, the King of Siam, an audience with the Pope. Incredible. Holy crap. That was something I was not trained for."

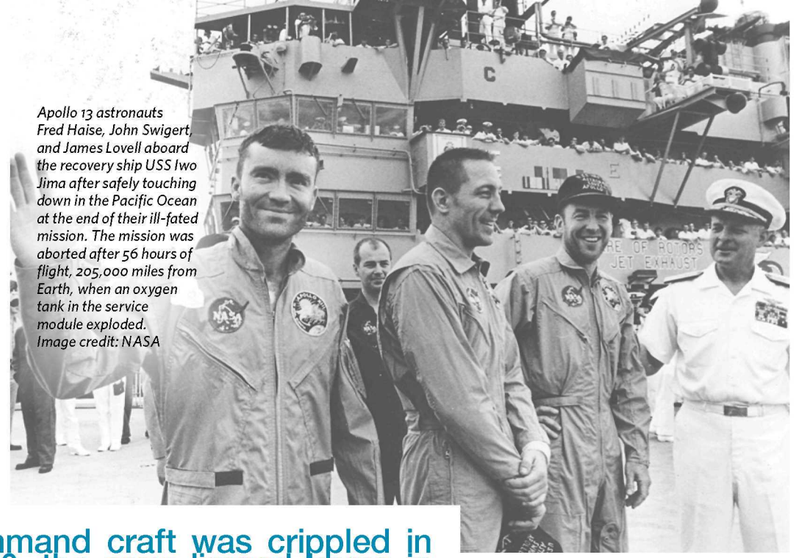
It was also the first significant social time Carpentier spent with the astronauts. Normally absorbed in the stressful and risky business of their missions, now they were celebrities on tour, allowing Carpentier to see them in a new light – particularly Armstrong, whom he had always regarded as an older brother figure. "In Spain, he made remarks in Spanish," Carpentier would later say at Armstrong's memorial service. "We didn't know he spoke Spanish. In France, he made remarks in French. No matter where we were, he always had something important to say about that country's history. He was undoubtedly the best-read person I ever met."

After a whirlwind 38-day tour, however, Carpentier was soon back at work. By this time, Apollo 12 had already gone to the Moon and back, and Apollo 13 was gearing up for a spring launch. Carpentier would resume his regular duties with the Apollo 14 crew, but not before having a front-row seat for one of NASA's most memorable sound bites: "Houston, we have a problem."

When the Apollo 13 command craft was crippled in an explosion in April 1970, the crew limped home in their lunar module, which could only supply half of the oxygen the astronauts would need for the four-day trip. Carpentier and the medical team scrambled to calculate the buildup of carbon dioxide while engineers devised a stop-gap solution to stretch the breathing supply until they reentered the atmosphere, a tense period millions of others would eventually share watching the film Apollo 13.

"It was just like it was in the movie," Carpentier later told the Canadian Space Agency, "that long silence, the blackout period that went on longer than on other flights. Maybe they haven't made it. Maybe we're never going to hear from them again. You think all of those things. Then, when they did, the place just erupted."

In one sense, Carpentier's time at NASA ended after the Apollo program. He had accomplished in the department's most historic decade more than most people do in a lifetime. More interested in studying medicine than becoming management, he left NASA for a residency at Baylor University, then spent the next 30 years working in nuclear medicine at Scott and White, a private company in Temple, Texas.



Apollo 13 astronauts Fred Haise, John Swigert, and James Lovell aboard the recovery ship USS Iwo Jima after safely touching down in the Pacific Ocean at the end of their ill-fated mission. The mission was aborted after 56 hours of flight, 205,000 miles from Earth, when an oxygen tank in the service module exploded. Image credit: NASA

When the Apollo 13 command craft was crippled in an explosion in April 1970, the crew limped home in their lunar module, which could only supply half of the oxygen the astronauts would need for the four-day trip. Carpentier and the medical team scrambled to calculate the buildup of carbon dioxide while engineers devised a stop-gap solution to stretch the breathing supply until they reentered the atmosphere, a tense period millions of others would eventually share watching the film Apollo 13.

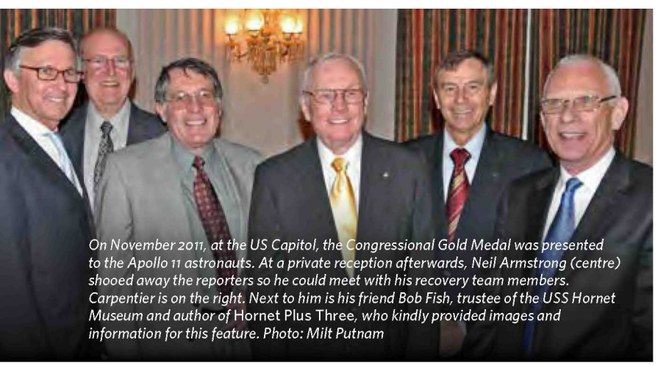
In another sense, this was just his first chapter. More than a flight surgeon, Carpentier was a powerful voice for the health of the astronauts, recording enormous amounts of physiological data to make future missions safer. He continued working as a part-time consultant for NASA, administering radiopharmaceuticals to crew members and collecting data on future programs such as Skylab and the space shuttle.

While he will be remembered for his contributions as a doctor, it's his data that will endure. Nearly five decades after he began collecting detailed physiological information from the astronauts, he is still compiling the records into a book.

"It sort of tells a story, but it's exploring the data and my feelings of what can be learned and where do we go. My whole purpose is to be able to document everything that went on during the Mercury, Gemini, and Apollo programs and do an integrated analysis. It's valuable information that is never going to be repeated. I'm done with Mercury, I've almost finished Gemini, I've got most of the data for Apollo, and I'm just gonna keep going, documenting everything from flight to flight to flight, as long as I'm able and as long as NASA will let me."

"All I got to do is live six more years to finish my projects and I'll be a really happy guy," he laughs. Although still in Texas, he summers at his cabin on Pender Island, and at 83, goes to CrossFit three days a week. As far as his legacy goes, he's more concerned with the data than his own name.

"Talking about this over the years, I guess what strikes me most is how bloody lucky I was to live through the golden age of space flight. Five hundred years from now, a thousand years from now, people will look back at the century and say 'What did those guys do back then, flying to the Moon for the first time?' It's going to be one of those things that the 20th century will be remembered for." T



On November 2011, at the US Capitol, the Congressional Gold Medal was presented to the Apollo 11 astronauts. At a private reception afterwards, Neil Armstrong (centre) shooed away the reporters so he could meet with his recovery team members. Carpentier is on the right. Next to him is his friend Bob Fish, trustee of the USS Hornet Museum and author of Hornet Plus Three, *who kindly provided images and information for this feature. Photo: Milt Putnam*

The Apollo 11 Recovery Team with Buzz Aldrin (wearing tie) at Splashdown 45 in 2014 at the USS Hornet Museum, held to commemorate the successful recovery of the crew. Carpentier is on the left, and John Hirasaki is standing behind Aldrin. Photo: Susan Wood Photography. www.SusanWoodPhotography.com

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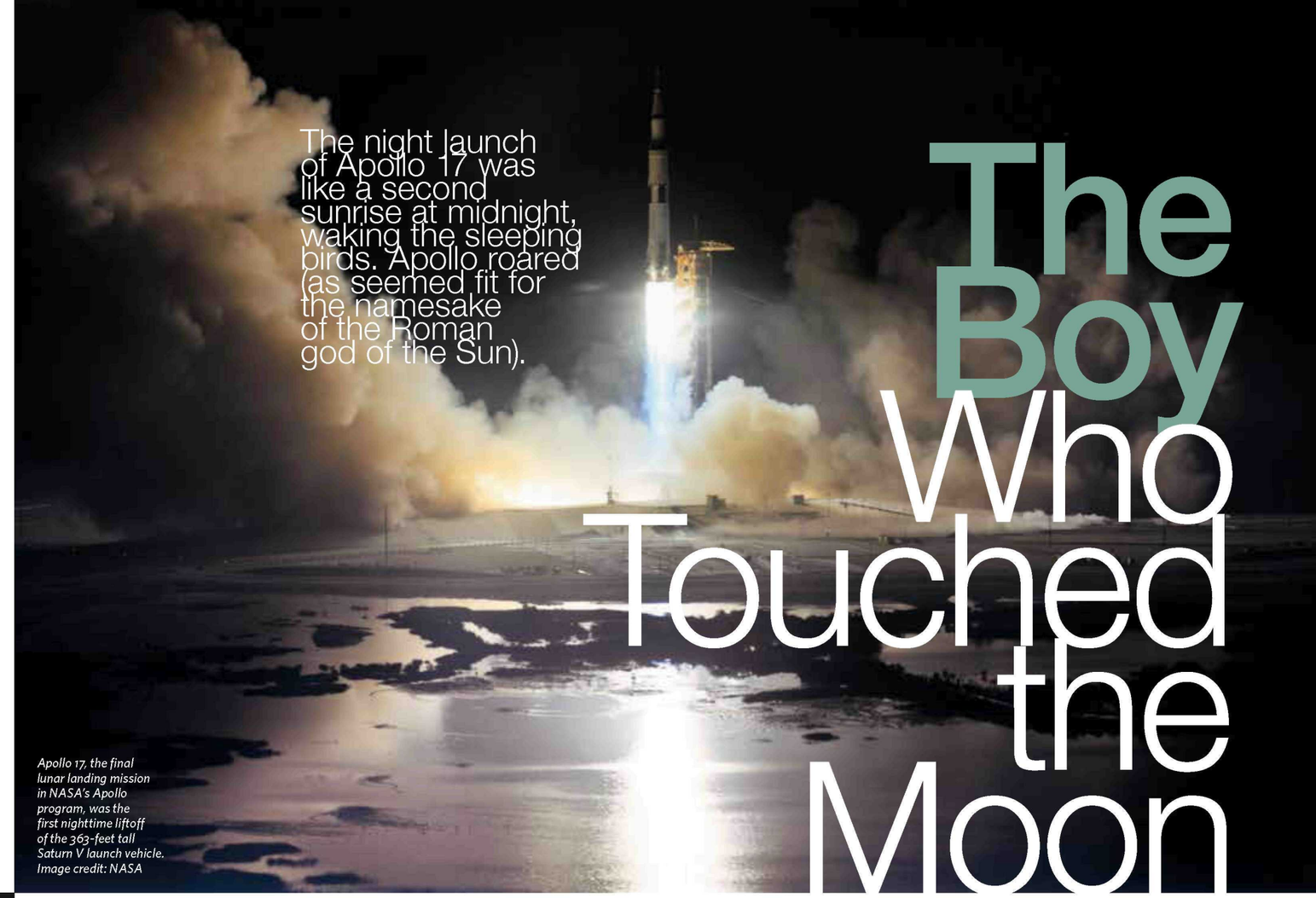
The Boy Who Touched the Moon



The night launch of Apollo 17 was like a second sunrise at midnight, waking the sleeping birds. Apollo roared (as seemed fit for the namesake of the Roman god of the Sun).

Apollo 17, the final lunar landing mission in NASA's Apollo program, was the first nighttime liftoff of the 363-feet tall Saturn V launch vehicle. Image credit: NASA

BY PROF. JAYMIE MATTHEWS,
OC, UBC PHYSICS & ASTRONOMY

Jaymie Matthews. Photo: Martin Dee

The boy lived on Earth. The boy was me.

I grew up as an only child in Chatham, Ontario, a smallish city in farming country. We were a fairly poor but strongly loving family who lived on the edge of town, in a neighbourhood that was – as they say – on the wrong side of the tracks. In fact, we did live close to the railway tracks. In one sense, we actually lived on the right side of the tracks. Because on the other side of the tracks was the smokestack of Darling's, a rendering plant. That's a "factory" where they turned inedible animal parts into ingredients that went into stuff like soap, toothpaste, crayons, glue and shoe polish. The stuff that came out of a rendering plant's smokestack did not smell good, so being on the other side of the railway tracks from one could be considered the right side of those tracks.

My first memories of my fascination with the stars start at the age of two. But I have no inspiring stories of how I fell in love with the sky. My mother June didn't take me out one warm summer night to share with me the Perseid meteor shower. My father Jim didn't read to me from *The Big Book of Space*, or anything like that. All I know is that I wanted to be who and what I am today before I could even understand what it meant to be who and what I am today.

I went straight from the Terrible Twos to the Theoretical Threes to the Feynman Physics Fours. My parents had no idea about the sciences and technologies that were my passions almost as soon as I left the womb. My dad worked at the assembly line of the International Harvester truck plant for 40 years. My mom worked at home, and during some summers at the local Libby's vegetable canning plant and at the Post Office during the Christmas rushes. Neither of them had gone beyond elementary school. But while they might have been puzzled that their son wanted to become an astrophysicist, they supported me in every way they could. When I grew into who and what I am today, it was because of them.

When I was seven years old, they bought me a telescope. A Tasco brand refractor – the cheapest model available – that they bought at Zellers. It may have been cheap, on a wobbly mount, with optics whose quality was more G.I. Joe than Galileo, but it was my first window onto the Universe.

I would take my telescope almost every night to the darkest place in our neighbourhood. The darkest place in our neighbourhood was the cemetery. Did I mention we also lived near the cemetery? 17 Wilkinson Street was a real estate agent's dream! Location, location, location! Close to the railroad tracks! A rendering plant nearby! Convenient cemetery! All that was missing to make our house a perfect timeshare opportunity was a minimum-security prison and a sewage treatment facility.

My parents allowed me to go to the cemetery late at night with my telescope. It was a smaller town, a different era, and my parents trusted me on my own even at the age of seven. Occasionally, while I was observing in the cemetery, an Ontario Provincial Police cruiser would patrol the graveyard. As the officers' flashlight scanned the tombstones, they would sometimes see a strange silhouette. Moving cautiously to the scene, they would find a seven-year-old boy and his Tasco telescope at two in the morning. They would ask "What's your home address, little boy?" I would dutifully respond "17 Wilkinson Street." The officers would escort me home, bang on the front door of our house, and one of my parents would get up from bed to tell the perplexed police that I had permission to be in the cemetery at that time of night.

By the time I was 13 years old, I was a full-blown junior egghead. An uber-astro-geek. My best friend Kevin and I were already chasing our dreams. He wanted to be a pilot and I wanted to be an astrophysicist. Kevin is now an Air Canada Jazz pilot, jockeying Dash 8 aircraft, and I am now an astrophysics professor. Sometimes the magic works.

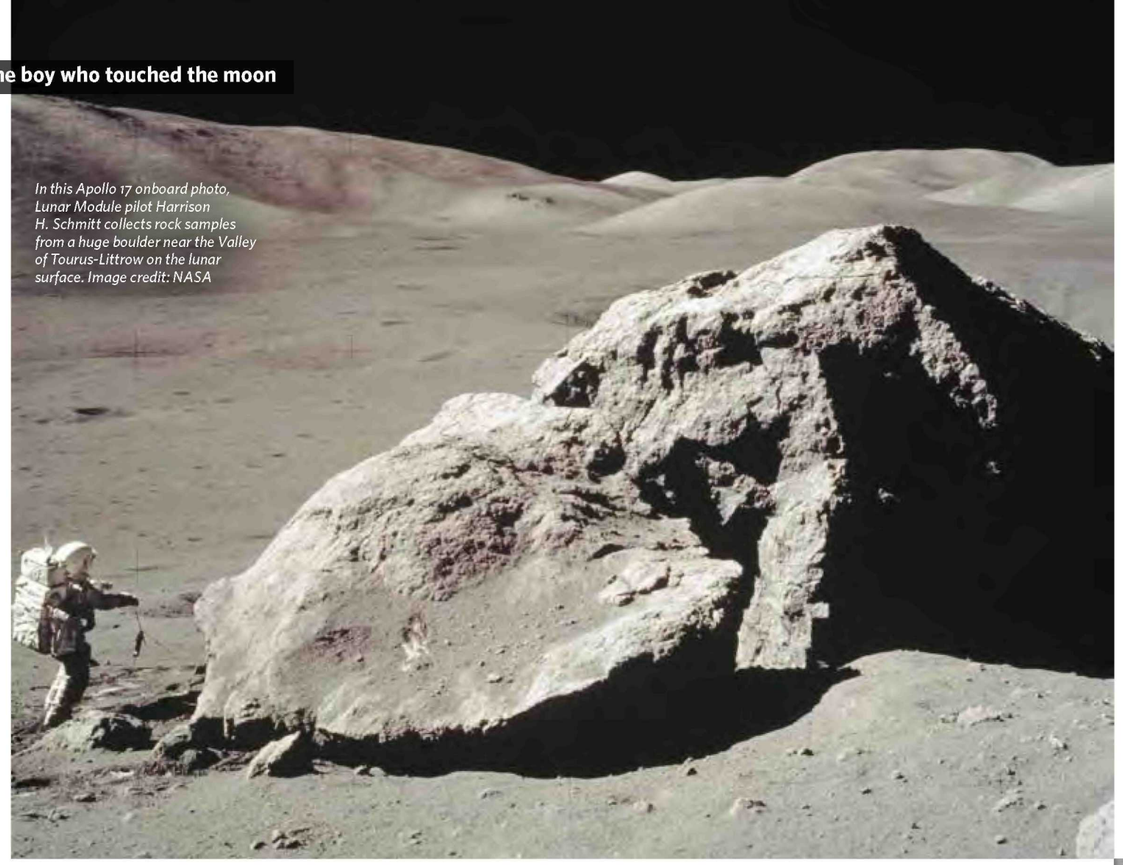
While I was still a junior scientist wannabe in Chatham, officials with NASA and the US State Department in Washington, DC, were devising a plan to commemorate the last Apollo mission to the Moon. They invited all the countries in the United Nations to send a youth representative – between the ages of 17 and 21 – to take part in what became known as the International Youth Science Tour. The young space ambassadors would have front-row seats at the launch of Apollo 17 in Florida, front-row seats at Mission Control in Houston during the last moon walk and would watch the splashdown of the astronauts' command module on a television screen in the United Nations building.

Eighty countries accepted the invitation, including Canada. To choose Canada's space ambassador, the government held a contest for anyone between the ages of 17 and 21 to write an essay about the importance of space exploration to humanity. I entered the competition.

I was only 13 years old. I lied about my age. I won.

By the time anyone in the Canadian government or in NASA knew how old I was (or more to the point, how young I was), it was too late to do anything about it. So, in December 1972, a now-14-year-old Canadian boy was off to Washington to join 79 older teenagers and young adults for the start of a 10-day adventure paralleling the eight-day adventure of the Apollo 17 astronauts. From the US capitol, a chartered 707 jet took us to our next stop: the Kennedy Space Center in Florida to watch the launch. We stayed in an Orlando hotel. I was in the room next to Neil Armstrong and his family, and we hung out at the pool together. How many kids (other than Neil's) can boast that they played "Marco! Polo!" with the first human to leave bootprints on the Moon?

We watched the launch from the VIP grandstands, about 5 km from Launch Pad 37-B. That put us on the



In this Apollo 17 onboard photo, Lunar Module pilot Harrison H. Schmitt collects rock samples from a huge boulder near the Valley of Tourus-Littrow on the lunar surface. Image credit: NASA

edge of what NASA calls the PLAFS (Post-Launch Advanced Fallback Zone). Translation into non-NASAese: Rocket scientists had calculated that, if the rocket exploded, pieces would fly no farther than 5 km before hitting the ground. So they put the control centre, the media, and the VIPs a little more than 5 km from the launch pad.

The launch of Apollo 17 was the first and only launch of a Saturn V rocket at night. Later in life, I was fortunate enough to witness a total solar eclipse in southern Hungary, where the Moon's shadow raced towards me across the farmland, and confused birds settled down for a brief false night in the middle of the day. The night launch of Apollo 17 was no less stirring, but the opposite experience. It was like a second sunrise at midnight, waking the sleeping birds. Apollo roared (as seemed fit for the namesake of the Roman god of the Sun).

In Florida, we were 5 km from the action. Once the astronauts were on the Moon, we – and everyone on Earth – were about 380,000 km from the action. But the young space ambassadors eventually found ourselves in Houston, Texas, at the Johnson Manned Spaceflight Center. The astronauts might be nearly half a million km away, but we had front-row seats in Apollo Mission Control, only metres from the big screens that showed us the last men to visit the Moon preparing to come home.

Just before the close-out, when the astronauts would return to their Lunar Module and leave the lunar surface, the Apollo 17 commander, Gene Cernan, and co-pilot, Harrison "Jack" Schmitt (the only scientist – a geologist – ever to visit the lunar surface) walked in front of the camera, near the US flag. Jack was carrying a rock. Gene started talking to us. To us! The last man on the Moon gave us a moon rock. It became known as the Goodwill Rock. When on Earth, it was cut into pieces and each of the International Youth Ambassadors presented theirs to their respective governments.

How many kids (other than Neil's) can boast that they played "Marco! Polo!" with the first human to leave bootprints on the Moon?

When I was 14, I had a moon rock. How many kids can say that?

In September 1973, I travelled from Chatham to Ottawa to present the rock to Governor General Roland Michener so that it could go on public display at the National Museum. At the Rideau Hall ceremony, with an RCMP honour guard, I gave away my moon rock. And in exchange, the Government of Canada gave me an autographed hardbound copy of the National Museum book *The Birds of Canada*.

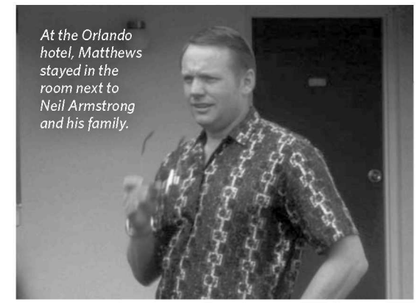
Decades later, I was hosting Apollo 17 commander Gene Cernan in Vancouver on a tour to promote his book *The Last Man on the Moon*. I told him the story and got him to sign the book they gave me. He wrote "Jaymie. I can't believe you gave away a moon rock for Canadian birds!"

The rock was put on public display in Ottawa, and every few months I would call the museum staff to check on it. In 1975, I was informed that the rock had been part of a travelling exhibit, and in Edmonton it has been stolen. I thought to myself: "If I'd known they were going to be so careless, I would have just kept it under my bed in a shoebox."

For years after that, I kept checking the news for any report that my moon rock had been recovered. There is a genuine black market in moon rocks. The agency responsible for recovering them is the US Customs Service. I guess the logic is that these rocks were imported into the United States. Imported from the Moon. In 1998, the FBI had a sting operation where they recovered the moon rock that had been given to the youth space ambassador from Honduras. That helped keep my hope alive that someday I would see my moon rock again.

By the time I was 13 years old, I was a full-blown junior egghead. An uber-astro-geek.

Matthews outside the White House, aged 14.



At the Orlando hotel, Matthews stayed in the room next to Neil Armstrong and his family.

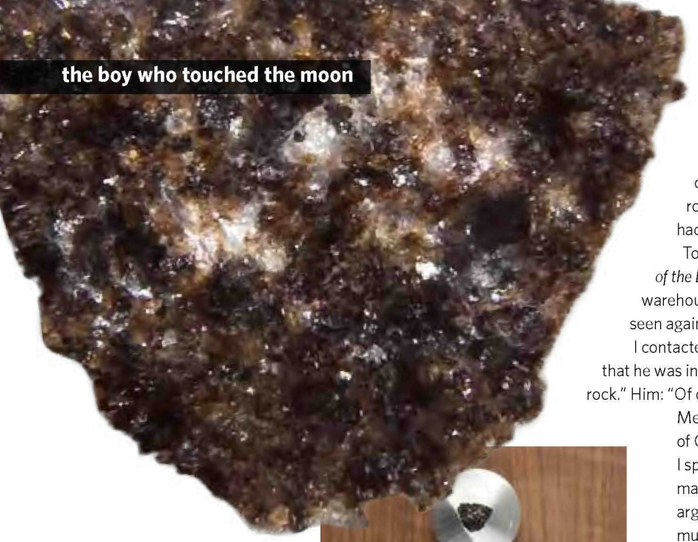
Apollo 17 astronauts Gene Cernan and Harrison "Jack" Schmitt spoke directly to the international youth science tour from the Moon. Noting that they had collected a very significant rock composed of many fragments, Schmitt said, "A portion of a rock will be sent to a representative agency or museum in each of the countries represented by the young people in Houston today..." Cernan said: "We salute you, promise of the future." Image credit: NASA

Signed photo of Neil Armstrong with the youth ambassadors.

I did. But in a very unexpected way.

In 2008, I was preparing a lecture on the Moon for an introductory astronomy course at UBC. I wanted to share with the students my very personal connection to the Moon, so I was searching the web for a picture of the Goodwill Rock before it had been cut into smaller pieces. I dug deeper and deeper, patiently trying different combinations of words in my search engine. After one particularly lucky keystroke, I caught my breath. My rock had appeared on my monitor. It was being held by a smiling man I did not recognize. In the lower right corner of the photo was a digital date and time stamp. The photo had been taken in the year 2000.

Using this as my first clue, persistent detective work eventually revealed the hidden location of my missing moon rock. A secure warehouse in the town



Canada's portion of the Goodwill Rock.

The inscription reads: This flag of your nation was carried to the Moon aboard Spacecraft America during the Apollo XVII mission, December 7-19, 1972. Presented to the people of CANADA From the people of the United States of America RICHARD NIXON 1973.

Photo: © Michael J. Bainbridge Photography

Matthews presented the moon rock to Governor General Roland Michener. In exchange, he received a copy of The Birds of Canada. *Decades later, the book was signed by Apollo 17 commander Gene Cernan, who wrote "Jaymie. I can't believe you gave away a moon rock for Canadian birds!"*

of Aylmer, Quebec, which stores much of the official collection of the Canada Museum of Nature in Ottawa. Nobody knew the rock was there until museum staff stumbled upon it 25 years after it had disappeared.

To me, it was a real-life version of the closing scene of the movie *Raiders of the Lost Ark*, where a janitor pushes a big crate containing the ark in a huge warehouse stacked to the rafters with other mysterious crates, never to be seen again. Indiana Jaymie and the Raiders of the Lost Rock.

I contacted the curator of the Museum of Nature, Michel Picard, to explain that he was in possession of my rock. Me: "Hello, Mr. Picard. You have my moon rock." Him: "Of course we do, sir. Please allow me to transfer you to our gift shop."

Me: "No, wait! I'm an astrophysics professor, and an Officer of the Order of Canada, and I was given the rock when I was 14 years old." Him: "May I speak with your caregiver or parole officer?" Me: "I have proof! The last man on the Moon signed my copy of *The Birds of Canada*." Him: "Hard to argue with that. Are you sure you wouldn't like me to transfer you to the museum gift shop? They have some very nice souvenir paperweights. Maybe one of those is the rock you're looking for."

That wasn't the actual conversation, but I suspect something like that was running through Mr. Picard's mind in the early going. Once he knew the backstory of me and the moon rock, Mr. Picard was intrigued and supportive.

While awaiting my personal milestone, the reunion with my moon rock, months passed and a more public moon milestone loomed. The 40th anniversary of the Apollo 11 lunar landing on 20 July 1969. In anticipation of that milestone, I was being interviewed by phone about the Moon and the legacy of Apollo by *Vancouver Sun* columnist Pete McMartin. At one point, I mentioned in passing my personal connection to the Moon. "Oh yeah, Pete, when I was 14, I owned a piece of the Moon."

I swear I could hear Pete's jaw hit his desk.

That became the lead story, on the front page of the weekend edition of the *Vancouver Sun*, just before the Apollo 11 anniversary. The headline: "The Boy Who Touched the Moon". The publicity, which spread beyond Canada to newspapers and web sites around the world, led to a question in many minds. Why was Canada's moon rock hidden from the eyes of Canadians, especially during the anniversary of one of the greatest milestones in human exploration?

The Museum of Nature was not prepared at the time to put the rock on public display, so the Canada Science and Technology Museum in Ottawa stepped forward and adopted the rock briefly. And I was finally reunited with my rock in November 2009.

No one knows how the rock ended up in that warehouse, or for how long it languished there unseen. It definitely wasn't stolen on a travelling exhibition, as I'd been told in 1975. Since even the most senior staff today at the Museum of Nature were not associated with the museum then, I fear we many never know the full story of its clandestine travels. My job – my passion – is to solve cosmic mysteries. Who'd have guessed that, in the journey of a moon rock born billions of years ago, carried to Earth across over 380,000 km of space as a souvenir by the last lunar tourists, the most mysterious leg of that journey would be a detour of 12 km from Ottawa to Aylmer, Quebec? T

alumni UBC 2018 Achievement Awards

PRESENTED BY boyden

alumni UBC is committed to an exceptional UBC and a better world. This November at the *alumni UBC* Achievement Awards, we honoured eight inspiring members of the UBC community who, through their extraordinary endeavours, have demonstrated this vision.

Congratulations to this Year's Recipients

YOUNG ALUMNI AWARD

Kahlil Baker

MSc'12, PhD'17

Dr. Baker co-founded Taking Root, a nonprofit organization promoting reforestation in Nicaragua to fight both climate change and poverty. Taking Root discourages the practice of clearing land to grow crops by creating economic incentive (carbon credits and the sale of sustainable wood products) to grow trees, resulting in the reforestation of thousands of acres.

FACULTY COMMUNITY SERVICE AWARD

Kathryn Shoemaker

MA'06, PhD'14

Through her work as a scholar, teacher, volunteer, writer and award-winning illustrator, Dr. Shoemaker is an influential advocate for reading and excellence in children's literature who is dedicated to the development, dissemination, and promotion of high-quality books. She has illustrated 40 children's books and produced an extraordinary collection of teaching and learning materials.

VOLUNTEER LEADERSHIP AWARD

Gerry Burch

BASc'48

Mr. Burch is a highly regarded forester who leads by example to support his community, his profession, and his alma mater. Active as a student leader in the 40s, he has maintained strong ties to UBC Forestry – establishing scholarships, leading fundraising efforts, and sharing his wealth of knowledge.

HONORARY ALUMNI AWARD

Charles Laszlo

CM, OBC

Dr. Laszlo is a pioneer of biomedical engineering in Canada who has made remarkable contributions as an educator, researcher and inventor, including leading the creation of UBC's own biomedical program. Hard of hearing since his twenties, he is an advocate for those with hearing loss and is an entrepreneur in the development of electronic hearing aids.

HONORARY ALUMNI AWARD

Dale Parker

UBC is a fortunate beneficiary of Mr. Parker's vast experience in corporate governance and finance. His many contributions have included leadership of the university's Investment Management Trust, which manages several key UBC funds valued at over $3.5 billion, and of the UBC Foundation, which encourages financial support. In the wider community, he serves several health-related organizations.

GLOBAL CITIZENSHIP AWARD

Nemkumar Banthia

PhD'87

Dr. Banthia is a world-class researcher in the field of advanced building materials who is dedicated to improving the lives of people in marginalized communities through innovative solutions to improve infrastructure. He is the CEO and scientific director of the India-Canada Centre for Innovative Multidisciplinary Partnerships to Accelerate Community Transformation and Sustainability (IC-IMPACTS).

RESEARCH AND INNOVATION AWARD

James McEwen

OC, BASc'71, PhD'75, DSc'11

Known as the grandfather of BC's biomedical engineering industry, Dr. McEwen invented the first microprocessor-controlled automatic surgical tourniquet system, which improved the precision, speed and safety of surgery and is now the standard of care worldwide. He established the Medical Device Development Centre – an incubator for many medical technology companies.

ALUMNI AWARD OF DISTINCTION

Charles E. Fipke

BSc'73

Dr. Fipke is an internationally respected geologist who founded Canada's first commercial diamond mine, establishing the country as a major producer of high-quality stones and creating thousands of jobs. Among other causes close to his heart, Dr. Fipke's philanthropy has benefited Alzheimer's research, the protection of wild animals, and UBC's Okanagan campus in his hometown of Kelowna.

Find out more at *alumni.ubc.ca/awards*

alumni UBC 2019 Achievement Awards

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Tina Mah
BSc (SFU), UBC DAP Student

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Tryggvason inputs data for the Microgravity Vibration Isolation Mount (MIM) experiment on the mid-deck of the Space Shuttle Discovery. Image credit: NASA

Man ON A Mission

In 1997, **Bjarni Tryggvason**, *BSc'72*, served as a payload specialist on Space Shuttle Mission STS-85. He spent 12 days in space.

BY CHRIS PETTY, *MFA'86*

Tryggvason prepares to enter the Space Shuttle orbiter Discovery during a practice exercise for launch day. Image credit: NASA

Bjarni Tryggvason grew up with a desire to be an astronaut, but knew it was a faint hope. Like most young people in the 1960s, he followed the space race with interest and was stuck to the TV screen during the moon landing. However, he was resigned to the idea that becoming an astronaut was likely out of reach for a Canadian.

Always fascinated by flying, he started taking flying lessons right out of high school and got a commercial pilot's license with the goal of eventually becoming an airline pilot. He enrolled at UBC as a backup plan. "You blow one pilot medical exam, and your airline career is done," he says. But the discipline he chose to study – engineering physics – hooked him immediately. "I ran into some really interesting stuff on the science side, decided not to become an airline pilot, and stuck with research and development."

It turned out to be a good plan. After UBC he did post-grad work at Western University in mathematics and fluid dynamics, which led by 1982 to a research position at the Low Speed Aerodynamics Lab at the National Research Council in Ottawa ("low speed" being anything under 480 mph). He was lead researcher investigating the wind loads for the Royal Commission on the sinking of the Ocean Ranger oil rig in 1982. As well as this work, he taught graduate courses in structural dynamics and random vibrations at Carlton and the University of Ottawa, accumulated thousands of hours as a pilot, and was a self-described fitness nut.

Even so, his focus was still primarily on research and development. But when the ads came out in 1983 to join Canada's newly created space program, he jumped at the chance. After an extensive vetting program, he was accepted as one of the first group of Canadian astronauts.

"I was already doing all the right stuff," he says, "so it wasn't a big career change for me. I was already into flying and research and fitness, I was a flying instructor and had experience in many kinds of aircraft. It was a natural fit for me."

Tryggvason supported Marc Garneau during his 1984 space shuttle flight, developing procedures for onboard experiments, and was on track for subsequent missions. But in 1986, the Challenger shuttle blew up during launch, delaying the next flights for Canadian astronauts by five years. During that time he began working on systems to isolate space experiments from the vibrations caused by the everyday workings of the spacecraft. He was the lead developer of the Large Motion Isolation Mount and the Microgravity Vibration Isolation Mount (MIM). At the same time, he trained as a backup astronaut for the 1992 space shuttle flight.

And then, in August 1997, came the chance to go to space. His job as on-board payload specialist was to conduct tests on the second generation MIM device and perform experiments that would highlight the effects of spacecraft vibrations on fluid experiments. The innovations he developed have been used on aircraft, the Russian space station, the space shuttle and on the International Space Station.

But does the job change just because you happen to be hurtling around the planet at unimaginable speeds? Does your mind wander off to dwell on the horrific possibilities of fiery death, or do you gaze, mind blown in religious rapture, at the sight of the Earth floating by? Not really, says Tryggvason. Your time is spent concentrating on your assignments. "You sit in the capsule for an hour and a half before launch," he says. "I noticed how everyone was so calm. We all had specific things to do and we did them. They weren't paying us to be afraid. Sure, you think about all the things that can go wrong, but when you start going through all the prep steps, you go into that mode you've trained for and you do your job. Anyway, if you focus on your fear you'll be petrified during the whole mission, as you're only a second away from dying at any time – a million things can go wrong. So fear doesn't really play a part."

Tryggvason sleeps on the Space Shuttle Discovery's mid-deck floor. Tryggvason elected to stop using a pillow, allowing his head to float freely in the Microgravity environment. Image credit: NASA

"You sit in the capsule for an hour and a half before launch. I noticed how everyone was so calm. We all had specific things to do and we did them. They weren't paying us to be afraid."

And as far as the rapture portrayed in various movies is concerned, he knows of hardly any astronauts who have had their minds blown during a mission. "Of course, the view is like nothing else," he says, "and I felt the awe of being so fortunate as to be the one who gets to do this. But mind-blowing? No. We're too busy doing our jobs."

He's often asked if being in the tiny shuttle caused any claustrophobia. "The shuttle looks cramped," he says. "It's as big as a good-sized bathroom, but you can use the whole volume, up down and sideways. And you're in free fall, so you can manoeuvre easily."

Which brings Tryggvason to a point of clarification. "People say there's no gravity up there, but that's just nonsense. If there was no gravity, you couldn't stay in orbit. You'd fly off into space. The gravitational acceleration to the Earth on the space station is 9 metres per second squared, compared to 9.8 on the ground. The Earth's gravitational field is almost as strong at that altitude as it is on the ground. A lot of people don't understand that. Imagine if you jump off the roof of a two storey building. For that few seconds you're in free fall. All your muscles are stress-free, all the pressure gradients of fluids have disappeared. That's what's going on in the free fall environment." It's the speed of the orbit that accounts for the weightless sensation of the free fall state, not a lack of gravity. The orbital speed of the spacecraft, 7.8 km per second, produces a 90 minute orbit around the Earth.

"[When sleeping], your brain tells you to roll over onto your side or back or whatever. Since you're in free fall, it doesn't matter, but your brain tells you to do it anyway. It's an interesting experience."

But how does one sleep when hurtling around the world in a free-fall state? "You sleep in sort of a sleeping bag. But since you're in free fall, you have to strap your pillow to your head, otherwise it would float away. You don't actually need a pillow, but you use it because you're used to having one. After a couple of nights I stopped using it because it just didn't make sense. Also, your brain tells you to roll over onto your side or back or whatever. Since you're in free fall, it doesn't matter, but your brain tells you to do it anyway. It's an interesting experience."

In 2009, Tryggvason flew a replica of the Silver Dart to mark the centennial of the first flight in Canada and the British Empire. Photo: Vaughan Merchant

And life after orbiting? Tryggvason and his son, an airline pilot, both fly competitive aerobatics as well as performing in air shows. For years after retiring from the Canadian Space Agency, he worked at the International Test Pilots school in London, Ontario, training pilots to become test pilots, and he still works as a test pilot himself. His expertise makes him a sought-after pilot for experimental and vintage aircraft. In 2009 he flew a replica of Alexander Graham Bell's Silver Dart to mark the centennial of the first flight in Canada and the British Empire. He has more than 6,500 hours as a pilot, and has flown more than 50 aircraft types. He is also currently working with a US-based group developing STEM experiments that are conducted on the International Space Station.

He completed the updated mission specialist training between 1998 and 2000, and was scheduled to go on another mission. But he felt his kids, both in high school in Florida at the time (his daughter is now a veterinarian), needed his attention to help them start on their careers and to reacquaint them with Canada. So he left Houston in 2001, figuring he'd spend a couple of years with family business, then return, but he never did.

But would he go up again given the opportunity? "Absolutely," he says. "In a flash." T

Phyllis Johnson and Peter Suedfeld are investigating the psychological effects of long-term space flight. Photo: Martin Dee

AT HOME IN SPACE

Two UBC researchers are conducting Canada's first psychosocial space experiment to learn how astronauts adjust to life in the cosmos.

By Madeleine de Trenqualye, *BA'07*

"All the conditions necessary for murder are met if you shut two men in a cabin measuring 18 feet by 20 and leave them together for two months," wrote Cosmonaut Valery Ryumin, following a mission onboard the Salyut 6 space station.

The cosmonaut's foreboding diary entry reflected a common fear from the early days of space travel. NASA psychiatrists worried that long-term space flight would be so dehumanizing, claustrophobic and stressful that astronauts would suffer from "space madness."

While there haven't been any space murders, UBC sociologist Phyllis Johnson and psychologist Peter Suedfeld say it's important to know more about the psychological effects of long-term space flight before we can hope to reach far-away destinations like Mars. Together, the husband-and-wife research team are conducting Canada's first psychosocial experiment on board the International Space Station. They want to learn how astronauts can not only survive the high-pressure and isolating experience of long-term space flight, but thrive in it.

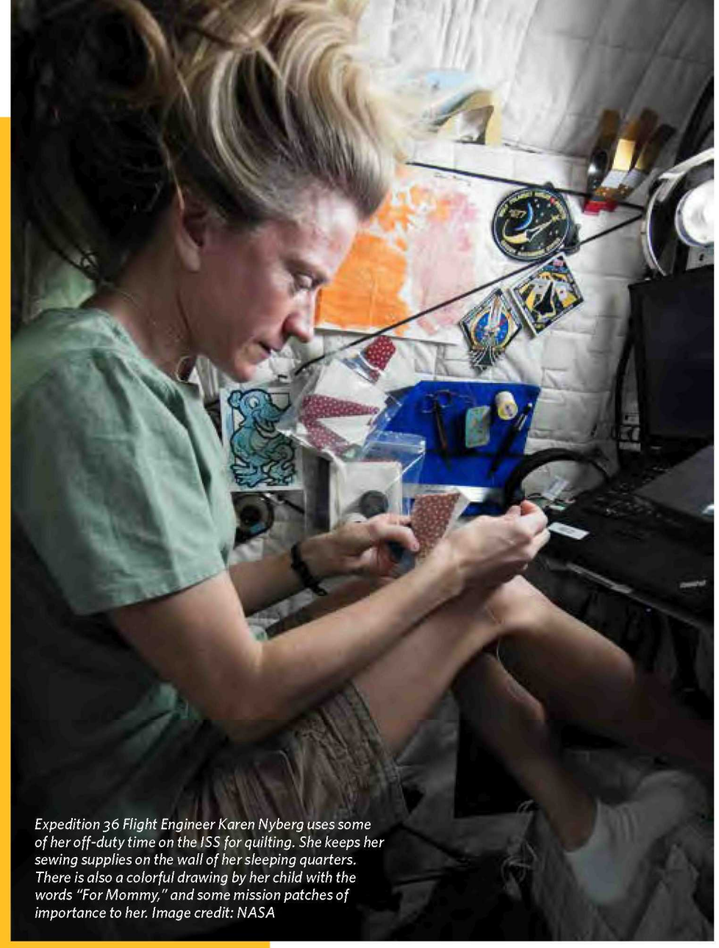
"We're looking at how astronauts cope with being in this extreme and unusual environment, where there's potential for danger and long absences from family," says Johnson, the principal investigator of *At Home in Space*. "How important is it to feel at home on the International Space Station? What do they do to make the station feel like home while they are there? What do they take with them to personalize their quarters? Which activities are the most important in creating a feeling of home and in developing a space culture?"

Getting a clearer picture of how astronauts acclimatize to life in space – including the emotional, cultural and environmental adjustments they make – can help guide future missions.

The researchers are also interested in how astronauts from a variety of cultures and nationalities create a unique "space culture" that transcends their cultural differences. Do they develop a set of shared cultural norms within the confines of an isolated spaceship?

The participating astronauts will complete a set of questionnaires before, during and after their journeys to assess changes related to how they cope with stress, how they connect to life on Earth, and how they build relationships with each other. Johnson has also asked the astronauts to photograph their living quarters as well as any customs and celebrations on board the space station.

She says there are many examples of space celebrations: crew members often mark 100 days in space with a small ceremony, enjoy celebratory meals after completing tough spacewalks, and celebrate Cosmonautics Day on April 12. Does this kind of cultural camaraderie increase efficiency and psychological well-being? And if so, how could space culture be accommodated in future missions?



Expedition 36 Flight Engineer Karen Nyberg uses some of her off-duty time on the ISS for quilting. She keeps her sewing supplies on the wall of her sleeping quarters. There is also a colorful drawing by her child with the words "For Mommy," and some mission patches of importance to her. Image credit: NASA

The sociology and psychology of space travel

Space travel might seem like an unusual research topic for a family sociologist like Johnson to venture into. But she says it fits into a larger body of research that looks at how families cope with long-term separation. Other sociologists in her field have studied military families, long-distance truck drivers, domestic workers, and families where one parent lives and works in a different part of the world – sometimes dubbed astronaut families. It seemed intriguing to Johnson to turn the lens on actual astronauts to study what they do to stay connected to their loved ones and how their families support them during long-duration missions.

Meanwhile, Johnson's husband and research partner – UBC psychologist Peter Suedfeld – brings his expertise on stress and human resilience to the project. A Holocaust survivor, Suedfeld became interested in how humans cope with stressful, novel, or traumatic experiences. After studying genocide survivors, polar explorers and prisoners in solitary confinement, Suedfeld turned his attention to space travellers.

At least one space mission has been cut short due to psychological problems and other missions have suffered from interpersonal clashes among the crew.

He says that when he first raised the issue of potential psychological problems during long-duration space flights, he was laughed at by a senior astronaut.

"He laughed at me and he said, 'You don't understand this. These are experienced military test pilots. Nothing fazes them. They can work together, they can work alone. There's not going to be any friction. There's not going to be psychological problems. They can deal with anything. They've got the right stuff.' Well, unfortunately he's not around to know that he was wrong and I was right, because there have been psychological problems of various sorts."

At least one space mission has been cut short due to psychological problems and other missions have suffered from interpersonal clashes among the crew, says Suedfeld.

NASA astronaut Scott Kelly shows off his personal living quarters on the ISS. Scott tweeted this image with the comment: "My #bedroom aboard #ISS. All the comforts of #home. Well, most of them. #YearInSpace". Image credit: NASA

"There have been situations in which astronauts were by the end of their stay up there so angry with each other that... one of them said, 'I don't even want to live in the same city as this guy for the rest of my life, never mind having any contact with him.' So it's good to know what conditions might bring that about, and how you could make the conditions more positive."

To that end, Suedfeld has worked with NASA and the Canadian Space Agency to help determine optimum capsule design for habitability and psychological health. And together with Johnson, he completed a multi-year study of retired Russian cosmonauts, analyzing their motivational profiles, coping strategies and post-experience growth, as well as how their work impacted their family relationships.

Their overarching goal is to identify the factors that increase astronauts' psychological well-being, rather than simply treating adverse effects, something known in the field as salutogenesis.

The researchers say that measuring post-experience growth will be an important part of this study, since space agencies and space psychologists have not paid as much attention to the beneficial long-term after-effects of spaceflight. To do this, they will assess the effects shortly after return and six months later.

Suedfeld says the positive effects can include a heightened sense of purpose, comradeship, as well as a satisfaction in achieving something that few people have done.

"People come back and feel stronger and more courageous – more competent to deal with other problems," says Suedfeld. "They become more universalistic. They think about humanity as a whole rather than the particular country that they come from. Some of them have expressed unhappiness that there is so much strife on Earth when, if you go into space, it's just this one beautiful blue marble."

At *Home in Space* wraps up in 2020. The project's findings could be used to improve bonding, morale and environmental design for communities on Earth living in remote, confined or isolated locations, including oil rig workers, crews on long-voyage cargo ships, researchers in remote locations and those on long military deployments. The researchers say the study could even have applications for elderly residents living in group housing who experience limits on living space, privacy, and control over their environment.

What we learn from studies in polar and space environments helps to predict and anticipate what might happen under certain circumstances in these communities, says Suedfeld. T

The researchers are interested in how astronauts from a variety of cultures and nationalities create a unique "space culture" that transcends their cultural differences. Do they develop a set of shared cultural norms within the confines of an isolated spaceship?

Expedition 34 crew members assemble in the Unity node of the International Space Station for a brief celebration of the Christmas holiday. The CSA's Chris Hadfield (R) is pictured with Russian cosmonauts and NASA astronauts. Image credit: NASA

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*~ UBC astrophysicist **Mark Halpern**, principal investigator, CHIME*

The CHIME telescope incorporates four 100-metre long U-shaped cylinders of metal mesh that resemble snowboard half-pipes. Its overall footprint is the size of five NHL hockey rinks.

The radio signal from the universe is very weak and extreme sensitivity is needed to detect it. The amount of energy collected by CHIME in one year is equivalent to the amount of energy gained by a paper clip falling off a desk to the floor.

CHIME collects radio waves with wavelengths between 37 and 75 centimetres, similar to the wavelength used by cell phones.

Dark Energy

The universe is expanding at an accelerating rate, challenging our understanding of basic physics. Scientists call the entity responsible for this phenomenon "dark energy," but do not know what it is. To study the properties of dark energy, astrophysicists have built a telescope called CHIME (the Canadian Hydrogen Intensity Mapping Experiment), located in Penticton, BC. CHIME, which has been operating for the past year, has no moving parts but maps cosmic radio signals over the sky visible from Canada every day. It will map the location of hydrogen gas, the most common element in the cosmos, creating a three-dimensional map of the structure of the Universe. Scientists can infer distances by measuring the sizes of these hydrogen structures, and the expansion of the universe from the colour of the light the structures emit. By tracing the structures through cosmic time, scientist will gain a better understanding of how the universe evolved and the role of dark energy.

Most of the signals collected by CHIME come from our Milky Way galaxy, but a tiny fraction of these signals started on their way when the universe was between 6 and 11 billion years old.

"CHIME's unique design enables us to tackle one of the most puzzling new areas of astrophysics today – Fast Radio Bursts. The origin of these bizarre extragalactic events is presently a mystery, with only a few dozen reported since their discovery a decade ago. CHIME will detect many of these objects every week, providing a massive treasure trove of data that will put Canada at the forefront of this research."

*~ Astrophysicist **Victoria Kaspi** (McGill University), DSc'18 (UBC), lead investigator for Fast Radio Bursts project*

Seven quadrillion computer operations occur every second on CHIME. This rate is equivalent to every person on Earth performing one million multiplication problems every second.

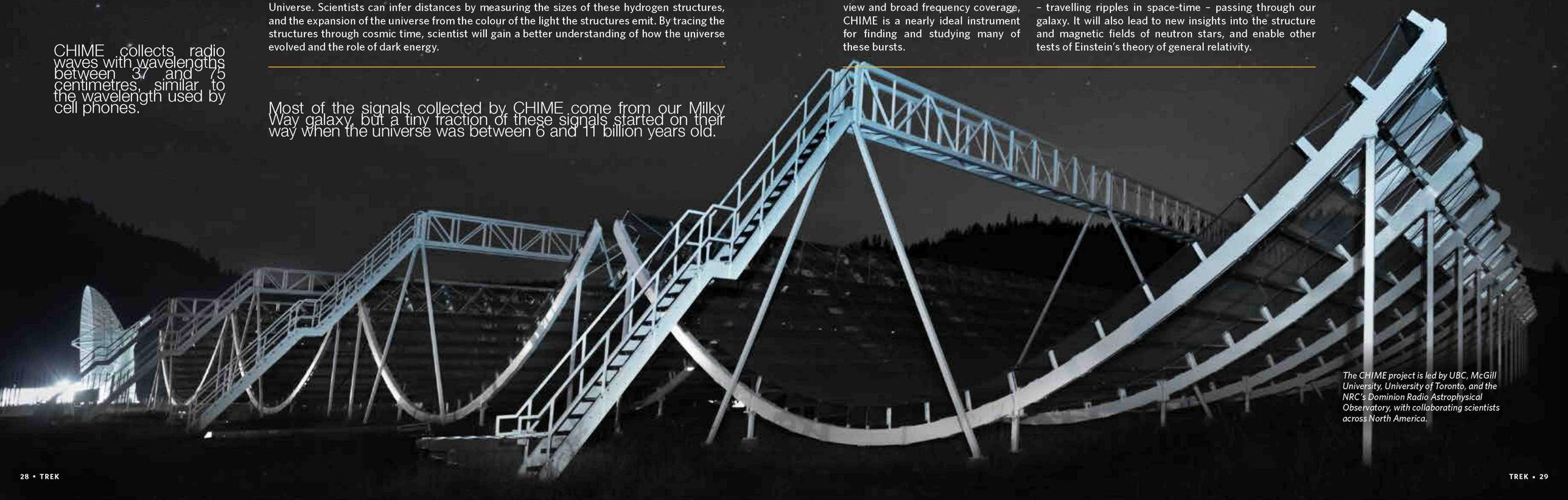
Fast Radio Bursts

CHIME is also being used to study Fast Radio Bursts – energetic single pulses of radio emission arriving in random directions from unknown sources well beyond our galaxy. Their origin is a major puzzle in high-energy astrophysics. With its huge field of view and broad frequency coverage, CHIME is a nearly ideal instrument for finding and studying many of these bursts.

Pulsars

The telescope will also monitor radio waves from pulsars, or neutron stars. In our galaxy, neutron stars spin, and the radio waves they emit pierce the sky like the beam from a lighthouse. The waves are observed as regular and repetitive pulses and are being used as cosmic clocks to gain insight into other phenomena. For example, the information will aid in the search for gravitational waves – travelling ripples in space-time – passing through our galaxy. It will also lead to new insights into the structure and magnetic fields of neutron stars, and enable other tests of Einstein's theory of general relativity.

The data rate passing through CHIME is comparable to all the data in the world's mobile networks. There is so much data that it cannot all be saved to disk. It must first be processed and compressed by a factor of 100,000.



The CHIME project is led by UBC, McGill University, University of Toronto, and the NRC's Dominion Radio Astrophysical Observatory, with collaborating scientists across North America.

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Golden

A CECIL GREEN PARK HOUSE STORY

They banter like George and Gracie, share the airtime, laugh a lot. UBC alumni Barbara and Ken Hallat are telling the story of their wedding reception at Cecil Green Park House on June 28, 1968, their 50th anniversary celebration there in 2018, and the years in between. They speak of being "lucky" and "blessed," and they're flirting like newlyweds. "Don't print that!" Barb cries after almost everything Ken says. "I'm under a gag order," Ken teases back.

Barbara Cartmell and Ken Hallat met on the ice rink at Kerrisdale Arena as grade 10 students at Sir Winston Churchill High School. For a couple of years, they played the field, as it was called in those days. As of grade 12, they dated exclusively. "We had lots of fun!" is how Barb explains their decision to go steady. Along with two other girls, they carpooled together to UBC, where Barb earned her BEd and Ken his MBA. "Over seven years, we talked about a lot of things," Barb says. "He was somebody I could trust and we knew each other well."

They were married at St. Helen's Anglican Church, where the minister, Barb's uncle, had double-booked the 6 pm time slot. They obliged the other couple, married at 7, and then moved the party to Cecil Green Park House. "There was no alcohol," Barb laughs, "just tea and coffee and a punch bowl. A little band. It was exactly what I wanted."

First developed in 1912, the Cecil Green estate features a fully revitalized old-world mansion and glass-covered terrace surrounded by lush, sprawling gardens and the sea. "We had access to Cecil Green Park House for the $15 alumni fee charged at the time," Ken reveals. Barb recalls a wedding party made up entirely of family, and many more extended family and close friends among their 100 guests. The impressive venue books just one event at a time, so they had the place to themselves.

"I always gardened with my dad," Barb reminisces, "so we loved the gardens. It was like having it at home."

"We loved the venue and the spectacular views from the patios." In fact, Ken admits, "We didn't look anywhere else."

The same was true when it came time to celebrate their golden wedding anniversary. "The 28th was booked," Ken says, "and we tried to get [the other party] to move their date, but they couldn't, so we held it on the 27th." Seems their graciousness has stood the test of time.

The secret to their happy marriage? "Balance," says Ken. "Your married life, your individual life, your career have to be in balance. Flexibility... there have to be two points of view. And do some work on the relationship, but don't make it a job!"

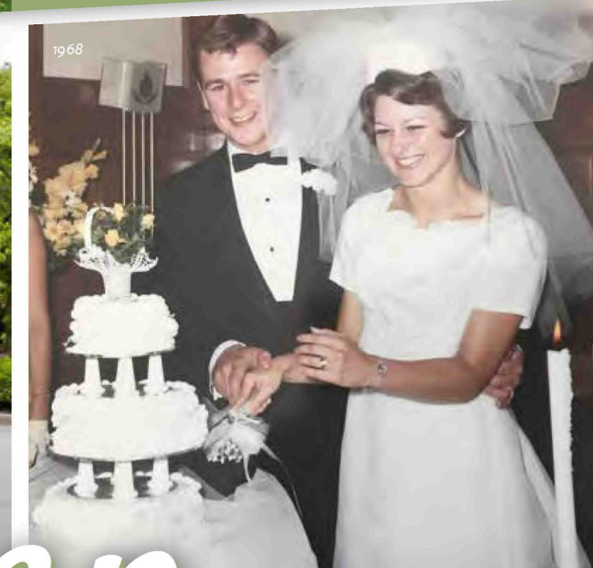
"Marry somebody you trust and love," Barb says, "and have fun!" There's a pause.

"Luck," she adds.

"Luck and timing," Ken says at the same time.

They laugh.

2018



1968

50th anniversary celebrations for Barb and Ken Hallat

Moon rock display at Erindale College (University of Toronto, Mississauga) 27 September 1969. David Strangway is pictured second from left. Image © University of Toronto

LUNAR ROCK STAR

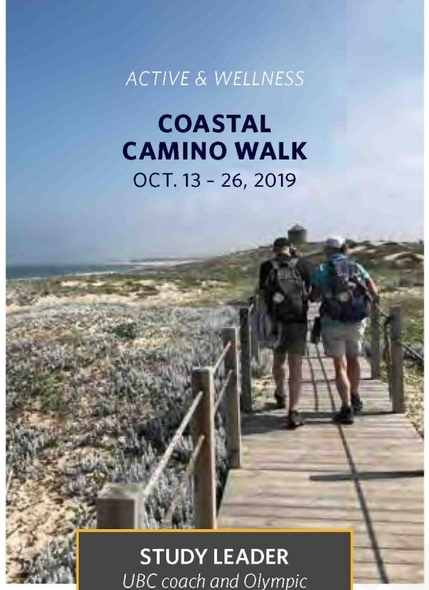
David Strangway was UBC's 10th president, serving from 1985-1997. He was a controversial figure in that he had a vision for the university that stirred debate. Some would say he transformed a middle-level, regional university into an international educational and research powerhouse (which he did); others would say he took a perfectly good, well-loved middle-level regional university and completely changed it (which he also did). In the process, he conducted what was at the time the largest fundraising campaign in Canadian university history. He went on to found Quest University in Squamish, BC, a private, non-profit liberal arts and sciences university. He died in December 2016.

Strangway was, as well, a renowned geophysicist. He taught at the University of Colorado until 1965, when he became an assistant prof at MIT. He joined NASA in 1970 as the chief of the Geophysics Branch. He designed lunar experiments for the Apollo missions and was the point person for the analysis of the samples returned to Earth.

He went on to design advanced geophysical experiments for the missions, select sites for investigation, and train astronauts to conduct experiments. (During one of the communications between Houston and the Apollo 17 astronauts, capsule communicator Robert Parker referred to Strangway as "Dr. Strangelove," a whimsical reference to the 1964 Stanley Kubrick film of the same name.) Strangway was also involved in developing electro-magnetic tools for lunar exploration and in studying the early history of the Moon by examining its magnetic field. He authored or co-authored more than 165 research papers that include results of his studies on the lunar samples, and in 1972 was awarded the NASA Exceptional Scientific Achievement Medal.

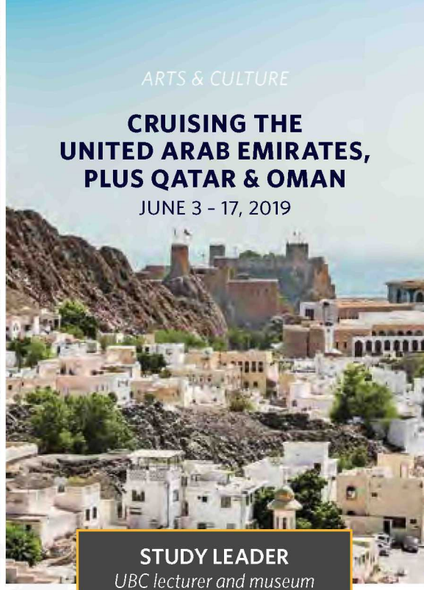
Strangway counted his years at NASA as the most exciting of his academic career. As well as his fascination with the science, the missions by nature were intense. "There was tremendous suspense," he told the *Alumni Chronicle* in 1985. "We had to be ready to make rapid responses if something went wrong with the mission or if somebody said, 'Look, there's only a few minutes left, what do we do first?' All the training, the priority setting, the team sense that went with this, and then culminating in the actual missions – that's what was so exciting at the time."

His office at UBC was a testament to his time at NASA. The walls were covered with depictions of the planets, and his bookshelves were crammed with space-oriented books, both coffee-table worthy and academic. I had the privilege of writing speeches and columns for him during his presidency, and he often talked, in an animated way, about his days at NASA. Like many academics-turned-administrators, he missed the exhilaration of pure research. He was, to the end, a scientist. ~ ***Chris Petty**, MFA'86*



STUDY LEADER
UBC coach and Olympic Medalist Lynn Kanuka

STUDY LEADER
UBC alumnus and safari guide Timothy Jackson



STUDY LEADER
UBC lecturer and museum curator Paula Swart

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CROSSING THE KARMAN LINE

Student rocketeers enter $1million challenge to send a rocket into space.

BY DIANE HAYNES, BA'89

UBC Rocket members with the remnants of their winning rocket, Cypress, at the 2017 Spaceport America Cup in New Mexico. Club founders Simon Bambey and Joren Jackson are second and third from left, respectively.

Team members finesse their design at the 2017 Spaceport America Cup

Co-captains Hubert Fortier (R) and Robert Chisholm

There was no shortage of new recruits at Build Day 2018

Lauren Lee heads the Composites team

Rocket Cypress on the launchpad

The competition at the 2017 Spaceport America Cup

Launch Sequence

Spring 2016, Fort McMurray, AB. Nineteen-year-old Hubert Fortier is nearly a year out of high school and apprenticing as a welder. He's submitted applications to a few universities, but he's counting on a career in the trades. That May, 125 wildfires burn through Alberta, 37 of them out of control, and one takes down his home. A week later, as family and friends are deciding whether to rebuild or relocate, Fortier receives an acceptance letter from UBC. Just like that, he is on his way to Vancouver.

Vancouver, Summer 2016. Engineering students Joren Jackson and Simon Bambey co-found UBC Rocket – Rocket for short – dedicated to the design, manufacture, and launch of suborbital rockets. When SpaceX successfully launches Falcon 9 from Cape Canaveral Air Force Station in Florida toward the International Space Station, Hubert Fortier watches live along with millions. "From then on," says Fortier, "it was all rockets." His timing impeccable, a Google search turns up the newly minted club.

September 2016. UBC Rocket hosts its first info session. It's standing room only. Applicant numbers are overwhelming, and Rocket becomes UBC's largest student engineering design team. Fortier makes the cut. His trajectory is set.

June 2017, somewhere near Truth or Consequences, New Mexico. The 10-month-old club arrives at the inaugural Spaceport America Cup with their first rocket to compete against 110 teams in the world's largest intercollegiate rocket engineering conference and competition. They beat out Caltech and MIT to bring home the trophy in their category.

September 2017-June 2018, Vancouver, BC. Encouraged by their success, the club refurbishes their winning rocket and builds three more. The founders are rewarded for their ingenuity: private aerospace manufacturer RocketLab in New Zealand brings Bambey on board as a Propulsion Intern, and Jackson lands a full-time gig as Integration and Test Engineer at SpaceX. Succession planning is suddenly a thing for the two-year-old club.

September 2018. Enter Hubert Fortier and Robert Chisholm. Both original members, they are now UBC Rocket's co-captains. The bar is high – 100 kilometres above sea level, to be exact. That altitude, called the Kármán Line, represents the boundary between Earth's atmosphere and outer space. The Base 11 Space Challenge, sponsored by National Rocketry League in the US, is offering $1 million to the first student-led university team to cross it before the end of 2021. The countdown is on.

Rocketeers

We are looking for people who do not shy away from long-term challenges, are able to commit a significant amount of time to the team, and are self-motivated to complete tasks to extremely ambitious deadlines, reads the UBC Rocket membership application. *Set aside roughly two hours to complete the form. Most of that time will be spent learning some rocketry basics.* Of 115 new applications, the club accepted 60, bringing total membership to 90. A conscious approach to inclusion means the team is diverse in every respect. Members hail from engineering, business, science, and arts. Some bring no relevant experience at all, but have proved over those two hours that they can learn, and they're willing to work.

ROCKET'S MOTTO IS A QUESTION: "WHAT COULD GO WRONG?"

By January, they'll have tested their first liquid-fuel engine, and in June will demo-launch a liquid-fuel rocket in Spaceport America Cup's 30K-ft challenge. The composites subteam, led by Lauren Lee, will use advanced techniques and materials to form the fin cans – the central structure that connects the fins and motor to the body of the rocket – as a single unit, a feat never before achieved by a student team. Both assays are prep for Base 11, the million-dollar challenge beginning in May of 2020. And if by chance they win that prize, Rocket will create two endowment funds at UBC of USD$500K each: one to sustain the club, and the other to support Geering Up, UBC's STEM subject camps, clubs, and workshops for school-aged kids in BC.

Rocket's motto is a question: "What could go wrong?" Answer: A lot. So they'll commit an average of 10-15 hours per week through the year, and 20-30 in the weeks leading up to competitions. They'll design, build, test, and rebuild. They'll manage projects and people, promote the club, engage with sponsors, advocate to Ottawa, and fundraise. They'll reach out to school kids in both BC and Alberta (primarily online), and build awareness, interest, and expertise in STEM subjects through Frequent Flyers, a new project in which participants of all ages design, build, and launch their own rockets and payloads. "I don't sleep much," Fortier laughs. By the time they graduate, they'll have enough real-world cred to launch stellar careers in any field they choose, including rocketry.

Unless, of course, they want to work in North America.

Final Frontier

Once among the world's leaders in rocket engineering, Canada no longer has a rocket program of its own. Meanwhile, the United States' International Traffic in Arms Regulations (ITAR) restrict the export of defense and military-related technologies for national security reasons. Translation: Canadian rocketeers can't find jobs on the home front, and they can't work for American rocketry companies, either. (In Joren Jackson's case, his Point Roberts address was the loophole that meant he could accept SpaceX's job offer.)

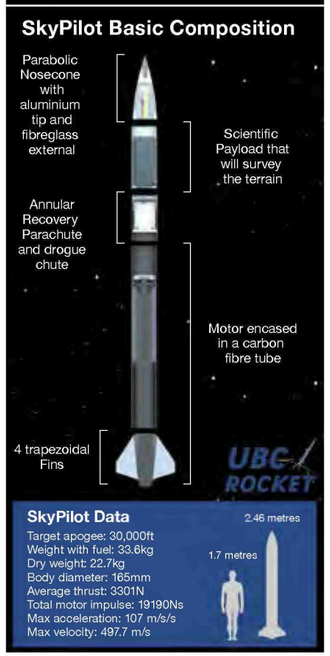
In fact, if Canadian rocketry activist Adam Trumpour hadn't made a mission of it, the Base 11 Space Challenge would be off limits, too. A concept designer at Pratt & Whitney Canada and co-founder of Continuum Aerospace in Toronto, Trumpour is also one of Canadian rocketry's loudest voices. At the 2017 Canadian Small Satellite (SmallSat) Symposium in Toronto, he invited UBC Rocket up to share the floor, and their combined passion raised enough money from the audience that day to create a Canadian rocketry competition, the first ever. Trumpour has a home lab, self-financed, that functions as the mobile service hangar for a home-built, liquid-fuelled rocket engine. His point: that the political, legal, and financial constraints around Canadian space-ex are rocket fuel for the do-it-yourself crowd.

The UBC Rocket membership is diverse, but the common denominator is a willingness to work and learn.

It's a growing crowd. There are 22 university rocketry clubs across the country, members of a nascent Canadian Rocketry Consortium (CRC) that is calling on Ottawa for reduced regulations, more launch sites, and greater public exposure. The CRC submitted a few grant applications to the Canadian Space Agency last year, and though they weren't funded, they did put the student rocketeers on the radar.

Space touches our lives on average 20-30 times a day. Weather forecasts and climate patterns, ATMs, GPS and smartphone maps, ground and air traffic control, industrial farming, and big-data management all depend on satellites. Space science is seminal to the development of autonomous cars, smart cities, robotics, and AI. Private firms are working on reusable rockets, 30-minute-max travel anywhere on Earth, and colonizing Mars.

UBC students are building SkyPilot to compete in the 30k foot category at the 2019 Spaceport America Cup.



The global space market is currently valued at over USD $380 billion and it is predicted to grow to the multi-trillions. A country without an independent ability to launch satellites risks its sovereignty.

Canada's Maritime Launch Services (MLS), founded in Canso, Nova Scotia, in 2016, is so far this country's only commercial spaceport. First launches are planned for 2020. It's a start, although for students clubs like Rocket that are already operating like companies, it hardly constitutes a job market. "I hate politics," Fortier says, "but I see it as part of my duty to make rocketry happen here. This is something I want to change."

THE POLITICAL, LEGAL, AND FINANCIAL CONSTRAINTS AROUND CANADIAN SPACE-EX ARE ROCKET FUEL FOR THE DO-IT-YOURSELF CROWD.

Homo Spatium

Space has always been the meeting place of fantasy and reality, the setting for everything from scientific research and starry romance to military strategy and geopolitical rivalry. Now, space exploration looms as a necessity for human survival. While growing legions of committed Earthlings strive to remediate land and oceans, many – including Fortier – already envision humanity as an interplanetary species. "Most of my friends think I'm crazy," Fortier laughs, "but one extinction event could wipe us out here." He knows better than most that, although there's no place like home, sometimes you have to leave. T

Help UBC Rocket Get to Space!

Rocketry is expensive. Preparation for the Base 11 Space Challenge alone will cost UBC Rocket close to $80,000. "We're about an eighth of the way there," club co-captain Hubert Fortier laughs. Want to help UBC rocketeers reach space? Here's a list of tools and materials they need. You can donate at ***support.ubc.ca/ubc-rocket***, or can email ***hello@ubcrocket.ca*** directly. *Per aspera ad astra!*

- autoclave – *for composite manufacturing and curing composite components*
- automated fiber placement machine – *for manufacturing composite parts*
- CNC machines & tooling – *for machining complex metal parts*
- filament winder – *for composite manufacturing applications*
- laser cutting machine – *for etching, cutting, and marking various materials*
- metal 3D printer – *for 3D printing very complex metal parts*
- welders & welding equipment – *for joining metals for manufacturing purposes*
- high volume 3D printers & filament – *for 3D printing large ABS or PLA parts*
- tool cabinets & workbenches – *for improving workspaces*
- standing drill press – *for manufacturing various metal, plastic, or composite parts*
- high performance PC workstations – *for running intensive simulations*
- oscilloscopes – *for analyzing electronic signals*
- reflow oven – *for reflow soldering of surface mount electronic components*
- various power tools – *for general work and various tasks*
- composite materials & supplies – *needed to manufacture our composite parts*
- safety supplies & equipment – *to keep our members safe*

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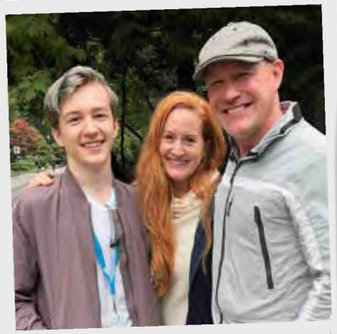
UBC Robert H. Lee Alumni Centre

prez LIFE

*Highlights from the busy schedule of UBC president Santa J. Ono. Follow him on Facebook, Instagram, YouTube and Twitter @**UBCprez***

Announced the launch of Blue & Goldcast, a monthly podcast co-hosted with Professor Jennifer Gardy from the School of Population and Public Health that considers big issues in higher education, from the perspective of UBC scholars, staff, and students.

Threw T-shirts to fans at the Thunderbird Stadium (getting in some practice for Homecoming in September). Photo: Rich Lam.



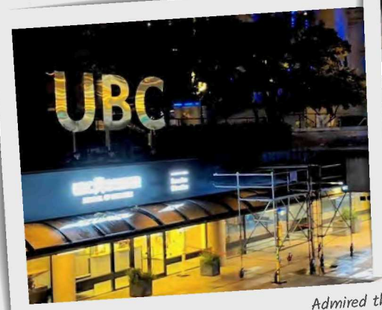
Greeted new student Seth and his parents on move in day.

Met with Dr. Arabinda Mitra, scientific secretary with the Government of India, to discuss further expansion of the significant collaboration between UBC and institutions in India.

Joined T-birds baseball team in Tokyo during their 10-day trip to Japan, where they had an opportunity to dress in traditional Japanese clothing.

Welcomed the first students in our new School of Biomedical Engineering.

Saw UBC graduate Manu at Pacific Central Station. Congratulated him on his new job in Alberta.

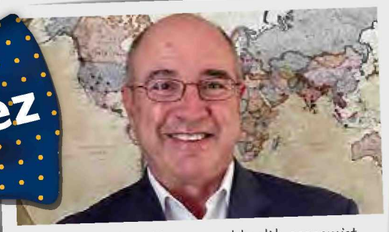


Admired the new signage at Robson Square.

Admired this amazing formula-style race car that UBC students built and compete in internationally at Formula SAE competitions.

Discussed ways of addressing climate change with University of California President Janet Napolitano. UBC is enthusiastic about contributing to this global challenge through collaboration.

@UBCprez



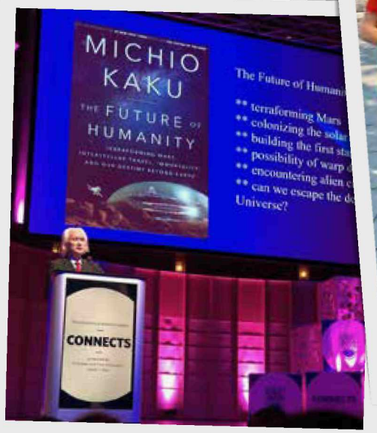
Welcomed world-renowned health economist Dr. Peter Berman from Harvard as new director of UBC's School of Population and Public Health.

Impressed to see a smart bike share system from Drop Mobility, which provides a fun new way to get around campus and support UBC's sustainability efforts.

Gave talk to first year students that focused on Bertha Wilson and Ruth Bader Ginsburg, two women who profoundly changed the world as Supreme Court Justices.

Met plenty of alumni at Homecoming in September.

Met with President Gonokami from the University of Tokyo. UBC and U Tokyo exchange outstanding students, collaborate at the highest level in transformational research, and work to build bridges between our nations.



Heard New York Times best selling author Dr. Michio Kaku speaking to a sold out Chan Centre for the Performing Arts, as part of the UBC Connects Public Lecture Series.

New video series:

Ask Santa!

For the first installment, visit *trekmagazine.alumni.ubc.ca*

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Regulating the Final Frontier

Can humankind cooperate to ensure safety and sustainable development in space? Two optimistic Canada Research Chairs have founded an institute to lead the way.

By Richard Littlemore

There is something about space that brings out the giddy enthusiast in even the most serious academic.

That thought occurs while sitting in the Robert H. Lee Alumni Centre with Dr. Aaron Boley, Canada Research Chair in Planetary Astronomy and co-founder of the new UBC Outer Space Institute. Boley is equal parts earnest and excitable; he's a space geek who skipped over the *Star Trek* fantasy conventions in favour of completing a PhD in Astrophysics (University of Indiana, 2007) and two post-doctoral fellowships, one at the Institute of Theoretical Physics at the University of Zurich and the second as the Sagan Postdoctoral Fellow at the University of Florida. His has been a serious path.

Yet, in talking about creating an interdisciplinary space institute at UBC, everything Boley says sounds like the breathless plotline of a Hollywood movie, from space mining adventures *a la Avatar* to orbital catastrophes such as *Gravity*. Except in Boley's version, there is always a happy ending – not just one where the good guys win, but an even cheerier narrative in which the plot-driving conflicts never even happen. If Boley gets his way – which is to say, if the UBC Outer Space Institute achieves its potential – the good guys will always get there first, anticipating problems, mediating disagreements and establishing a rules-based regime that allows humankind to apply in space the lessons learned from every colonial calamity that has ever occurred on Earth.

If Boley gets his way – which is to say, if the UBC Outer Space Institute achieves its potential – the good guys will always get there first, anticipating problems, mediating disagreements and establishing a rules-based regime that allows humankind to apply in space the lessons learned from every colonial calamity that has ever occurred on Earth.

If that sounds naïve – even hopelessly optimistic – you'd best not say so to Boley's Outer Space Institute co-founder, Dr. Michael Byers, Canada Research Chair in Global Politics and International Law. Byers doesn't just think Boley is right; he has evidence and argument on his side. Despite the messy state of planetary politics – our failure to deal collectively with global issues like climate change or species extinction – Byers says: "Countries collaborate in cold, dark, dangerous places." He learned as much working in the Arctic on everything from international agreements on resource development to search-and-rescue protocols. In remote, unforgiving locations, Byers says, "We become more aware of our common humanity."

Still, it's best not to leave these things to chance. So, Byers and Boley have gathered scientists and social scientists in almost every imaginable discipline to join an Outer Space Institute. From UBC, there are physicists and astronomers, political scientists and lawyers, medical doctors and sociologists. Outside experts include people such as Paul Meyer from Simon Fraser University, a former Canadian ambassador for disarmament; David Kendall, the retired former chair of the United Nations Committee on the Peaceful Uses of Outer Space; and Tanya Harrison, director of Research at the Arizona State University NewSpace initiative. There's even private-sector participation, such as with Brian Israel, a former US State Department legal advisor who is now with Planetary Resources, Inc.

In remote, unforgiving locations, Byers says, "We become more aware of our common humanity."

Per the earlier Hollywood references, the first two research themes are space mining and space debris, which cover both the most promising opportunity and the most immediate threat.

Threat first: since the Russians orbited Sputnik I in 1957, humans have launched more than 5,000 satellites into space. These objects stayed; wavered; wandered off into a higher "graveyard orbit"; re-entered Earth's atmosphere and burned up; or broke up and scattered, creating a near-Earth-orbit debris field that now contains 20,000 pieces of space junk that are large enough to track, roughly 10 centimetres in diameter and up. But there are more than 500,000 pieces if you count everything bigger than one centimetre. And, as Boley explains, those little pieces do count. Bigger pieces will do more damage, but a piece of space junk that's big enough to track is also obvious enough to avoid; the US military issues an average of 21 warnings a day of potential debris collisions, so satellite owners can adjust their track. But the little pieces are much more plentiful, and coming at you at 58,000 kilometres an hour, even a one-centimetre chunk can tear a dangerous, perhaps catastrophic, hole in a piece of space infrastructure.

We've known about this for a long time. The US conducted the high-altitude Starfish Prime nuclear test in 1962 and the resulting detritus knocked out as many as 10 early-generation satellites. It was partly on that basis that the US, Russia and the UK signed the first Outer Space Treaty in 1967, promising no weapons of mass destruction in space and prohibiting any nation from claiming sovereignty over a celestial body. If anyone needed a reminder of the danger of banging around in the heavens, China conducted what Boley describes as a "very successful" anti-satellite missile test in 2007, creating more space debris than any previous event in history. In accurately deploying a "kill vehicle," the Chinese blew one of their own weather satellites into 2,000 pieces, golf ball size or larger.

The danger here is that debris begets more debris as pieces smash about, breaking up other satellites. This threatens a cascade of damage that could cripple our ability to operate in the critical near-Earth orbit, where thousands of satellites now provide a huge range of services, including: weather forecasting, global positioning systems, aircraft and ship communications, financial services, agriculture, forestry, fishery and climate change science and research, search and rescue, and disaster relief. If a near-Earth orbit debris field really got out of control, it could compromise our ability to send anything into space, creating a kill zone that would keep us locked on our own planet – or forcing us to completely redesign every space vehicle and satellite.

The promise here is enormous, especially for space exploration and development. Asteroids are a likely source for water, fuel and other resources that could be crucial to support extra-planetary missions; it would be much easier to harvest those materials in space than to try to blast them in sufficient quantity off the gravitationally stubborn planet Earth. Commercial enterprises are also working to take advantage of these new opportunities. For example, the American company Planetary Resources, Inc. has attracted investment from the likes of Google executives Larry Page and Eric Schmidt, Ross Perot, Jr., and (perversely, given the dour image of mining that he offered in *Avatar*), Hollywood producer and director, James Cameron. The US also passed a Commercial Space Launch Competitiveness Act in 2015, making it legal to "own" anything that you bring back from space, even if the Outer Space Act prohibits you from claiming ownership of the body from which you harvested the bounty.

The second issue, space mining, is similarly critical and, in some regards, carries similar risks. Extra-planetary resource development is no longer a distant theoretical possibility. Even today, the Japanese space agency (JAXA) is stalking the asteroid Ryugu with a craft called Hyabusa2, looking for a safe place to set down so it can dig into the asteroid and bring samples back home.

This becomes increasingly complicated. If you mine a small asteroid, for water or precious metals, you could consume it or destroy it. Given their relatively small size, asteroids have a limited gravitational pull, so if you start scraping about, it would be difficult to contain the dust and rocks that might drift off into space – again creating a potentially dangerous debris field. As Earthlings begin to grapple seriously with these issues, Boley also wonders whether we should be thinking of preserving some asteroids for scientific or even aesthetic purposes. As the solar system's last supply of unprocessed inorganic and organic materials, asteroids may hold invaluable secrets to such things as the origin of planets, he says. Some may also prove to be inherently precious or beautiful. And space tourism is also a promising area; we don't want to wreck the seven wonders of the near-Earth world before people have a chance to enjoy them and learn from them.

If a near-Earth orbit debris field really got out of control, it could compromise our ability to send anything into space, creating a kill zone that would keep us locked on our own planet – or forcing us to completely redesign every space vehicle and satellite.

It's for these and many other reasons that Boley has become a policy guy, adding the creation of an Outer Space Institute to his astrophysical research to-do list. "I'm a scientist, but the policy questions just leap out," he says.

And Byers says Boley is "an invaluable collaborator," adding, "I can't work on law and policy without some understanding of the astrophysics."

UBC, they argue, is also the natural place for an institute of this type. Canada is one of the world's most important space powers, on the strength of extra-terrestrial expertise that can be traced directly to UBC talent, including John MacDonald and Vern Dettwiler, who founded MacDonald Dettwiler and Associates, the company that is famous, among other things, for building the RadarSat satellites and the Canadarm.

Byers and Boley also return to their optimistic view that the world is ready to cooperate in space if only someone shows leadership. "It's just a question of how we get nations to play well together," Boley says, adding that, "Really, it's already working. Even at the height of the Crimean conflict in 2014, Americans continued to fly back and forth to the International Space Station aboard Russian Soyuz rockets."

Space, it seems, is not just the final frontier: the infinite place may also the place of infinite possibility. T

***Read more about the institute here:* www.OuterSpaceInstitute.ca**

Photo: CTV Media

class ACTS

What have you been up to lately? Share your latest adventures, unique stories, milestones, and journeys with fellow alumni in Class Acts. Don't be shy. You're a member of *alumni UBC* – you've got bragging rights.

If your submission includes photos, please ensure they are as high-resolution as possible. Submissions should not exceed 750 characters (about 200 words), and may be edited for length and clarity where necessary.

trekmagazine.alumni.ubc.ca/classacts

Super Seo Siblings

By her own admission, high school home economics teacher **Martina Seo**, *BHE'00, BEd'09, MET'17*, is not among the world's foremost athletes. So, when her brother, **Phil Seo**, *BCom'03*, invited her to join him in applying for a spot on CTV's hit show *The Amazing Race Canada*, her expectations were low. "Whatever, it's just an audition tape," she recalls thinking at the time, "we won't get on."

It's true that Phil, a long-time fan of the series, had previously applied several times without success. But the show has a seasonal theme and this year's – celebrating everyday Canadian heroes who have given back to their communities – seemed like a perfect fit for the Seos. Between them, Phil and Martina have recorded over 10,000 hours of volunteering around the world, including banking manager Phil's participation in the UBC Sauder School of Business' Executive Mentorship program.

The show's producers evidently agreed, selecting the pair from among thousands of applicants. This gave rise to Martina's first Amazing Race challenge: "I had never watched the show," she admits, and was more than a little daunted after studying all five previous seasons. "I was so scared. I didn't want to get eliminated on the first episode!"

While physical training was important race preparation for the "Super Seo Siblings," as they called their team, it was balanced with a strong emphasis on strategy. The Seos bought a map of Canada and, based on their observations from past seasons, began theorizing the challenges they might encounter across the country. Phil, who has a background in logistics and operations, even enrolled in a course on game theory.

All their planning, however, did not fully prepare them for the rigours of the race. "It was literally a thousand times more intense than I thought it was going to be," says Phil. Martina's fear of early elimination almost became reality when, in the first episode, she was faced with climbing an 80-foot loggers pole in Squamish, BC. After 45 exhausting minutes and more than a few tears, the final stretch seemed all but impossible. "It took me a very long time to do it, and I almost quit," she says. But with Phil's encouragement – and a bit of motivation from a competitor's aggressive ascent of the neighbouring pole – Martina reached the top and helped the Super Seo Siblings finish second-to-last, avoiding elimination by a whisker.

That moment, Martina says, was a turning point. "After I was able to do that, I realized that I could really accomplish anything." The Seos' never-give-up attitude helped them become a fan favourite, and the pair steadily climbed the rankings as the race progressed. In the span of only a few weeks, their travels took them from BC to the Yukon and back, Indonesia, Ontario, Manitoba, Prince Edward Island, Mexico, and New Brunswick. It was in Fredericton, NB – the penultimate leg of the race – that the Seos finally met their match, ending their run in fourth place.

Despite the disappointment of not making it to the finale, the Seos look back fondly on their experience and would jump at the opportunity to do it again. "It was the best time of my life," says Martina, "I loved it!" The competitors, she says, have all become friends, sharing an online messaging group to keep in touch. One contestant – Olympian skeleton racer Melissa Hollingsworth – will even be joining Martina as a guest chef in her home economics class.

The civic-minded Seos have already been able to translate their newfound fame into ways to give back, attending meet-and-greets, giving presentations, and holding *Amazing Race Canada* viewing parties in support of local Vancouver charities. When asked if she encountered any teachable moments in her race, Martina offered some of the optimism for which she's become well-known. "I want my students to know that if I can get to fourth place on *The Amazing Race Canada*, then they can even go farther than me. I want to inspire them to know that you don't have to be an Olympian, or a CFL player, or an Argos cheerleader, or in the RCMP – you just need to have a lot of heart and you can go far."

1960s

Ray Grigg, *BA'61, DLitt'02*, has released his tenth publication, *The EcoTrilogy*, a selection from his more than 750 environmental columns over the past 16 years. Covering a breadth of topics – mostly philosophical in *Ecologos*, mostly psychological in *Ecopathy*, and mostly biophysical in *Ecocide* – the 64 chapters per book are informative and carefully footnoted for additional reading, but the collective effect is to underscore the complexity of our environmental challenge. In this regard, *The EcoTrilogy* is a realistic assessment of our situation, neither hopefully optimistic nor ominously pessimistic. The message in the books is implicitly clear: that we are racing against time with very little margin for error. *The EcoTrilogy* is available from the author at *www.raygrigg.com* or at bookstores in Campbell River, the Comox Valley, and Quadra Island, where he lives on a lovely ten-acre property with **Joyce Baker**, *BMus'69*. • **Penny Douglass**, *BSc'68*, reports that a group of class- and room-mates from the Rehab Medicine class of 1968 recently gathered to share the 50th anniversary of their graduation. Image (top right): L-R Lyndsay (Thomson) Fukushima, Penny (Rofe) Douglass, Joanne Stan, Dorothy (Shives) Genge, Donna (Bishop) Prelypchan, Janey (Brasell) Cole-Morgan. • In 2017, **Ron Smith's**, *BA'69, DLitt'02*, latest book, *The Defiant Mind: Living Inside a Stroke* (Ronsdale Press), was long-listed for the BC Book Awards' George Ryga Award for Social Awareness in Literature and won the IPPY gold medal in autobiography and memoir from USA's Independent Publisher. *The Defiant Mind*, originally published in 2016, offers a first-person account of Smith's journey through a debilitating stroke. With acuity and humour, Smith chronicles his process of recuperation – the challenges of communication, the barriers to treatment, the frustrations of being misunderstood and written-off, the role of memory in recovering identity, the power of continuing therapy, and the passionate will to live. Stricken by partial paralysis and limited to typing with only two fingers, Smith's writing process lasted 18 months. His goal, above all, was to deliver a message of hope: that life can go on, even after what he calls a "carpet bombing of the brain."

Members of the Rehab Medicine Class of '68

Ron Smith

Anita (Fuoco) Boscariol

1970s

Anita (Fuoco) Boscariol, *BA'78, LLB'82*, recently retired as director general, Treaties and Aboriginal Government Negotiations West, Indigenous & Northern Affairs Canada, and joined Vancouver law firm Watson Goepel LLP as leader of its new Indigenous Law Practice Group. Following a high-quality education obtained at UBC (for both her undergraduate degree in French and subsequent law school training), and a lengthy career in law and public policy, Anita's latest adventure with the new practice group involves assisting and advising a variety of clients in matters related to issues of Indigenous self-government, economic development, governance, and engagement, consultation and accommodation. Anita's husband is also a UBC alumnus, and, following in the family tradition, her two daughters have gone on to receive undergraduate degrees from UBC as well. The next generation? Well, that's still TBD. • **Ken Cameron**, *MA'70 (Community and Regional Planning)*, has published *Showing the Way: Peter Oberlander and the Imperative of Global Citizenship*, focusing on the life of the late Peter Oberlander, founder of UBC's School of Community and Regional Planning. The book traces Oberlander's remarkable trajectory from refugee to key member of the team assembled by UBC President Norman Mackenzie to provide the trained teachers, lawyers, architects and planners needed to build a new society in British Columbia after World War II. Oberlander's life epitomized the concept of citizenship as a set of rights and responsibilities that we must exercise at local, national and global levels. The book is available online as well as through the UBC bookstore. • **Kristina Mayer**, *BEd'75*, of Victoria, BC, remarried on December 9, 2017, to a long-time friend in Chicago, Illinois. Kristina's new husband, Wayne M. Erck, is a retired two-star general of the United States Army. Kristina and her husband now split their time between Victoria and Chicago. • **Charles Ernest Watson**, *MA'74*, remembers fondly his years at UBC obtaining a degree in comparative literature and teaching as an instructor in the Department of English for several years. He relocated to Mesa, Arizona, after graduation and has retired after more than 40 years in the car business, most recently Penske Automotive Group. He will be the first to point out, however, that he is not a "car guy!" He is an advocate of high levels of empathy and integrity in the sales profession. Charles has recently published two books: *Sales Coach for Beginners: Ten Basic Rules* and *Ten Best Practices*. In addition, he has written several books of poetry in the phoenix desert series. All are available through ***amazon.com*** • **Wes Wong**, *BSc'74, (MMath'78, U of Waterloo)*, retired from full-time vocation in informational technology at the turn of the decade. Now, he is focused on serving the Lord Jesus Christ in church ministry, and has transitioned from IT (Information Technology) to OT (Old Testament) and NT (New Testament). To be more efficacious in his ministry service, Wes returned to school and earned a Master of Theological Studies ('12, McMaster Divinity) and Doctorate of Ministry ('17, Tyndale Seminary). Blessed with over 40 years of management and ministry experiences, Wes currently serves the Lord in a voluntary role as management consultant at the Canadian Chinese Alliance Churches Association.

(L-R) Leslie, Lily, Robert, Carol and Graham Lee with Jeff Todd, executive director of alumni UBC and AVP, Alumni

Robert H. Lee, *BCom'56, LLD'96*, wins CCAE Friend of Education Award

UBC's very own **Robert H. Lee**, *CM, OBC*, was presented with the prestigious Friend of Education Award from the Canadian Council for the Advancement of Education (CCAE) at a ceremony in Halifax on June 6. This national award recognizes individuals who are committed to education and have made a significant contribution to institutional advancement in Canada.

Affectionately known throughout campus as "Mr. UBC," Lee envisioned and founded the UBC Properties Trust, which helps support the university's mission through optimization of its land assets and has added $1.35 billion in value to the university endowment to date. He has given countless hours of service as a member of the UBC Board of Governors, as chancellor, and in many other volunteer roles. His passionate advocacy, philanthropy, business leadership, and volunteerism have transformed the university, which will continue to experience the positive outcomes of his work for years to come.

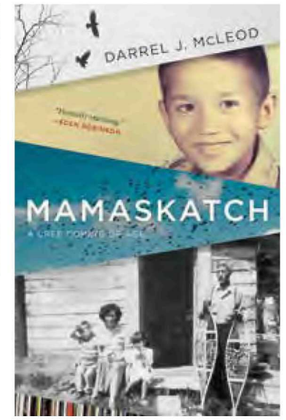
1980s

After his first novel, *Full Curl*, won the 2018 Arthur Ellis Award for Best First Crime Novel in Canada and was short-listed for the Rakuten Kobo Emerging Writers award in the mystery category, **Dave Butler**, *BSF'81*, is releasing the next instalment in the Jenny Willson mystery series on Dundurn Press. In *No Place for Wolverines*, Park Warden Jenny Willson initiates a covert inquiry into a proposed ski hill in Yoho National Park. She's quickly drawn into a web of political, environmental and criminal intrigue that threatens to tear apart a small BC town, pitting neighbour against neighbour, friend against friend, family against family. After a wolverine researcher dies in a mysterious fire, Willson forms an uneasy alliance with an RCMP corporal and an Idaho-based investigative journalist to expose the truth behind the ski hill project. With characteristic tenacity, she discovers that perception differs from reality. Willson ends up in a show-down with the American proponent, with her own agency and with political puppeteers who pull strings in the shadows. Ultimately, Willson must decide if she's willing to risk her career – and perhaps her life and the lives of those close to her – to reveal what lurks in the darkness. • **Joel Murray**, *BA'81, MA'99*, successfully defended his Doctor of Education degree from Simon Fraser University in January 2018, and attended his convocation in June. His dissertation, *From the inside out: A hermeneutic phenomenological exploration of the ethical dilemmas and lived experience of an associate dean*, examined how academic administrators in the post-secondary context resolve ethical dilemmas in their practice. Dr. Murray has worked at Kwantlen Polytechnic University since 2000, where he currently serves as associate dean of the Faculty of Science and Horticulture. • **Darrel J. McLeod**, *BA'84, BEd'85*, has recently released his memoir, *Mamaskatch: A Cree Coming of Age*, on Douglas & McIntye. *Mamaskatch* is a series of linked, storylike chapters telling the story of a Cree boy growing up near Lesser Slave Lake, Alberta. Like many indigenous children, McLeod longed for happiness, peace and a normal life – his reference for "normal" being Archie comic books. Instead, he found himself immersed in situations of terror and tragedy, with his strong and tender mother transforming into a tormented and tormenting figure, his older brother growing into a flamboyant drag queen, and his one promising father figure, brother-in-law Wally, catapulting him into a life of secrecy as he involves Darrel in schemes of abuse. This abuse opens a cavern of questions about his gender identity and future, and this struggle – to know who he truly is, and to move out from under a dark cloud of shame and guilt – becomes a key thread in the book. Darrel's young life takes on a blurring pace from the tiny village of Smith in the boreal forest of northern Alberta, to the Rocky Mountains, to the city (Calgary) and eventually to the west coast. Along this path he struggles to hold onto his Cree culture and his sanity, though torn by the disintegration of family, poverty, suicide, issues of gender identity, racism, and bullying. Yet deep and mysterious forces handed down by his mother help him survive and thrive. Buried deep inside, Darrel had her love and strength, and the continued presence of the magical birds that she gave to him as a protective force. Their reappearance at different junctures of his life, guiding him "home" to a fulfilling and adventurous life. • After completing a five-year appointment to the Ontario Municipal Board, **Joe G. Wong**, *BCom'84*, recently returned to the practice of municipal law at the City of Cambridge and is now a solicitor with the City of Hamilton.

The Chemical Engineering Class of 1993 at their 25th reunion

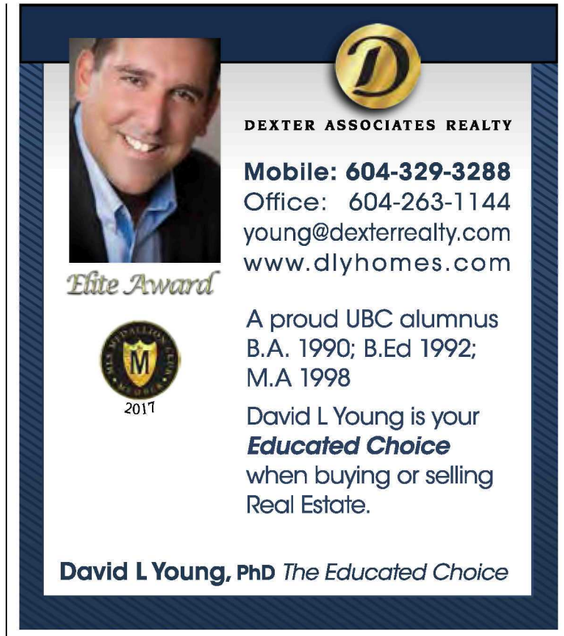
1990s

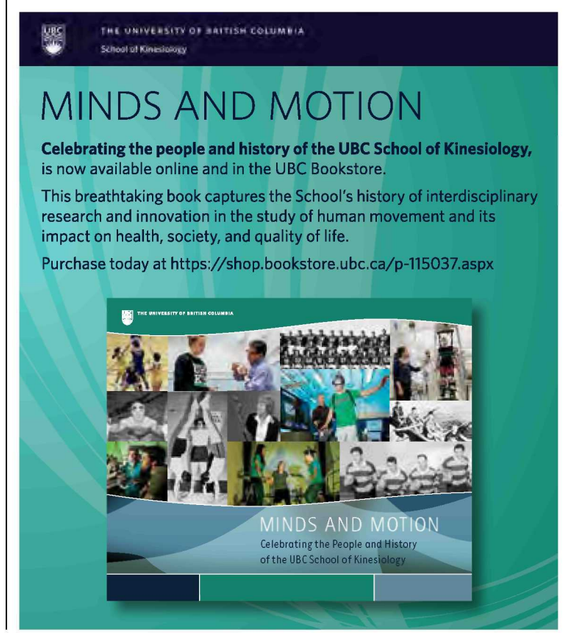
Jillian Cooke, *BASc'93*, reports that the Chemical Engineering Class of 1993 held their 25-year reunion on the weekend of May 18-20. It was well attended with more than 30 alumni returning to UBC from Singapore, Hong Kong, Texas, Connecticut, Oregon, and across Canada. They first celebrated at a pub night, with new custom patches for their reds, and the next day Marlene Chow (director of Academic Programs, Administration and Resources for the Faculty of Chemical and Biological Engineering) and Dr. Peter Englezos led a tour of the "new" building and labs. The engineers' cairn provided a location for group photos. Faculty, staff, and family joined the classmates at the new ESC/Cheeze, where the class presented a cheque to the department for $10,000 towards the much-loved third year field trips. They closed the festivities with a fun slide show, spanning first jobs to current news for each grad. More gatherings to follow!



2000s

In her new book, *Collecting Art in the Italian Renaissance Court: Objects and Exchanges*, **Leah R. Clark**, *BA'04*, examines collecting practices across the Italian Renaissance courts, exploring the circulation, exchange, collection, and display of objects. Rather than focusing on patronage strategies or the political power of individual collectors, she uses the objects themselves to elucidate the dynamic relationships formed through their exchange. Her study brings forward the mechanisms that structured relations within the court, and most importantly, also with individuals, representations, and spaces outside the court. The book examines the courts of Italy through the wide variety of objects – statues, paintings, jewellery, furniture, and heraldry – that were valued for their subject matter, material forms, histories, and social functions. As Clark shows, the late fifteenth-century Italian court can be located not only in the body of the prince but also in the objects that constituted symbolic practices, initiated political dialogues, caused rifts, created memories, and formed associations. • Who knew how important a degree in English could be? For **Jennifer Ward**, *BA'04*, it gave her the writing and critical thinking skills necessary for work she is honoured to do. After graduation from UBC, she spent ten years as an English Instructor at Northern Alberta Institute of Technology before working in the K-12 system Indigenizing curriculum. She also received a Master's degree from Athabasca University with her project Grounding Curriculum & Pedagogies in Indigenous Knowledge & Indigenous Knowledge Systems. Now, as Educational Developer at the University of Alberta, she has been a keynote speaker at a national conference and a guest speaker at other educational institutions in Alberta. This year, she embarks on her PhD journey. • **Magda Konieczna**, *MJ'05*, has recently released *Journalism Without Profit: Making News When the Market Fails*, her new book on Oxford University Press. As mainstream journalism struggles, news nonprofits attempt to fill the gap by providing quality information that is essential to our democracy. But can these nonprofits deliver better results than legacy news organizations? In this book, Konieczna investigates the present and future of nonprofit news organizations. She argues that sharing and collaboration define these organizations in unexpected ways that both enable and limit their ability to produce good journalism. • **Ak'ingabe Guyon**, *PGY'06*, was recently awarded the Public Health Physicians of Canada President's Award for outstanding contribution to public health and preventive medicine. This is partly a reflection of efforts carried out by Guyon and her colleagues to analyze and denounce the current weakening of public health in Canada,





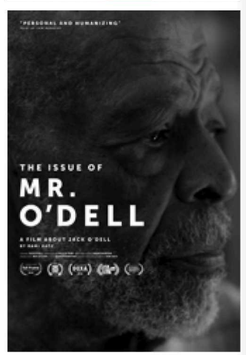
Manoj Dabir

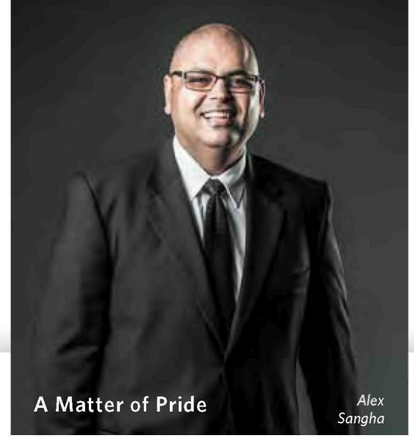
including articles in the *Canadian Journal of Public Health* and for CBC. • **Jane Whittingham**, *BA'06 MLIS'14*, is the author of two picture books, both published by Canadian publishing house Pajama Press. *Wild One* (2017) follows an imaginative and enthusiastic little girl through her busy day, while *A Good Day for Ducks* (2018) was inspired by Vancouver's many rainy days! You can connect with Jane on her website, *raincitylibrarian.ca* • On May 2, 2018, the Burnaby RCMP held its annual Officer in Charge awards ceremony, which recognizes the valuable contributions of its employees, police officers, community partners, and residents for their outstanding service and dedication to public safety. **Manoj Dabir**, *MBA'09*, was honoured to be among this year's awardees, recognized for his volunteer contributions to the local community. Burnaby RCMP Officer in Charge Chief Superintendent Deanne Burleigh presented the awards in presence of the Mayor and city council. Dabir has been volunteering with the RCMP community services since 2009, and cherishes the opportunity to give back to the community where he has lived for the last 15 years. • For the first time, the most innovative food policy solutions in the Nordic Region have been collated in a single document. *Solutions Menu: A Nordic Guide to Sustainable Food Systems*, edited by **Afton Halloran**, *BSc'09*, covers nutrition, food culture and identity, public food and meals, food waste and sustainable diets. It includes 24 policy examples – from local, national and regional levels – designed to trigger new conversations and inspire new policies in other parts of the world. Each solution represents a tangible step to address a specific issue; together, they represent a new and holistic approach to food policy. They are also testament to the fact that soft policies can deliver solutions and play a significant role in pursuing ambitious national and international goals. Read more at *norden.org/solutionsmenu*

2010s

Business sustainability consultant **Eduardo Sasso**, *AASM'15*, has released his new book, *A Climate of Desire: Reconsidering Sex, Christianity, and How We Respond to Climate Change*. Drawing on his experiences in Costa Rica, Vancouver, and Montreal as a member of the global climate movement, Sasso's reflects on the constructive role that religion can have in public life. In particular, he draws inspiration from the faith traditions that nurtured the abolitionist and early civil rights movements, as well as from new global initiatives working toward a low-carbon future. Learn more at *climateofdesire.com* • **Rami Katz**, *MFA'17*, has released his thesis film, *The Issue of Mr. O'Dell*. Lauded as a "personal and humanizing portrait" by *POV Magazine*, the documentary explores the life and work of Jack O'Dell, a ninety-four-year-old civil rights activist who once worked closely with Martin Luther King Jr., and now lives in Vancouver. The film had its world premiere at the 2018 Full Frame Documentary Film Festival, where it received the President's Award, and premiered in Canada at the 2018 DOXA Documentary Film Festival. Katz received the H. Norman Lidster Prize for Documentary Filmmaking while studying at UBC, and has directed several short documentaries that have screened at nearly two dozen film festivals around the world. He lives in Vancouver. T

Rami Katz




A Matter of Pride
Alex Sangha

The Governor General of Canada has recently awarded **Amar (Alex) Sangha**, *BSW'99*, with the Meritorious Service Medal (MSM) for founding Sher Vancouver, a not-for-profit society providing assistance to LGBTQ South Asians and their friends, families, and allies.

Awarded annually, the medal recognizes individuals who, according to a letter Sangha received from Director of Honours Sacha Richard on behalf of Governor General Julie Payette, have made "remarkable contributions in many different fields of endeavour, who inspire others and who share a common goal of making a positive difference."

Originally launched in 2008 as an online support group for LGBTQ Sikhs, Sher Vancouver gradually expanded to become an umbrella organization for all members of the queer South Asian community. As their membership grew, so too did the scope of Sher Vancouver's initiatives. Among these are the Dosti project (2009), bringing South Asians into local schools to give workshops about coming out; the Out and Proud project (2013, *shervancouver.wordpress.com*), an online platform to showcase the strength and diversity of the global queer South Asian community; and a 2016 campaign to raise funds in support of an Indian youth studying in Vancouver whose family abandoned him after he came out as gay.

Sher Vancouver's colourful floats have become a crowd favourite of the Vancouver Pride Parade, and in 2017 Sher Vancouver became the first LGBTQ organization to be part of the Vancouver and Surrey Vaisakhi parades – some of the largest Vaisakhi events in the world outside of India.

Sangha dedicates the Meritorious Service Medal to his mother, Jaspal Kaur Sangha, crediting her for "raising me and my two brothers largely as a single parent."

"Most importantly," adds Sangha, "I am hoping this recognition will provide me with a platform to continue to advocate for LGBTQ people around the world who are victims of abuse, discrimination, oppression, and even torture and death."

For more information, visit *shervancouver.com*

ALUMNI BUILDER AWARDS

Congratulations to our Alumni Builders

Created in 2017 as a part of *alumni UBC's* 100th anniversary, the Alumni Builder Awards recognize a cross section of alumni from all faculties who have contributed to the University and enriched the lives of others. In doing so, they have supported *alumni UBC's* vision of a global community with shared ambition for a better world and exceptional UBC. We are proud to honour this year's Alumni Builder Award recipients whose generous contributions have been recognized by their UBC faculty.

Lindsay Alfaro, *MSW'17*
For her distinguished service within the Faculty of Health and Social Development.

Parm Bains, *BSc (Agr)'79*
For his mentorship, passion for agriculture and commitment to the excellence and sustainability of the Faculty of Land and Food Systems.

Bruce Blackwell, *BSF'84, MSc'89*
For his long record of service to the Faculty of Forestry.

Greg Chang, *DMD'86*
For his distinguished and inspirational community leadership, and tireless advocacy for the Faculty of Dentistry.

Nancy Cho, *BSc (Rehab)'82*
For her dedication to education and furthering the practice of physiotherapy, and many years of volunteer service to the Faculty of Medicine.

Denis Connor, *BASc'63, MASc'65, PhD'69*
For his dedication and advocacy in support of the Faculty of Applied Science.

Chad Embree, *BCom'11*
For his peer mentorship in UBC Sauder School of Business and inspirational passion and knowledge for digital marketing, strategy and ecommerce.

Richard N. Liu, *BA'93*
For his long record of service fostering connections with alumni and students in Beijing and Asia as well as dedication to mentoring students in the Faculty of Arts.

Michael McDonald, *LLB'88*
For his long record of support to the Indigenous Legal Studies program at the Allard School of Law.

Glen Mulcahy, *BPE'91*
For his contributions to the School of Kinesiology and his long record of mentorship.

James Seabrook, *BASc'11*
For his distinguished leadership and significant contributions to the School of Engineering.

Andrew Trites, *MSc'85, PhD'91*
For his leadership, passion, advocacy, and long-standing dedication to the multidisciplinary facets of environmental education, conservation and ocean sciences.

Swamy Yeleswaram, *PhD'92*
For his distinguished leadership and contributions to the Faculty of Pharmaceutical Sciences.

Read more about the recipients at **alumni.ubc.ca/builder**

alumni UBC

In memoriam

Raymond "Bruce" Jones, ***BA'51***

Raymond "Bruce" Jones passed away peacefully on September 21, 2018. Late of Maple Ridge, BC, age 92 years. Predeceased by his wife Wineva (Sandy). Survived by his spouse Art Pearson; three children, Craig (Richard), Jennifer (Peter) and Chris (Kathy); and sister Colleen Nielsen.

Ronald Arnison, ***BASc'54***

On June 5, 2018, Ronald (Ron) Arnison passed away peacefully in his sleep, aged 86. He is loved and survived by children Debra (Glen Sutton), Susan (Greg Olsen), Mark (Tami Cooper), and Jan (John Levenick). Missing him deeply are grandchildren Jessica Morrison Golosky (Eric Golosky), Amy Morrison, David Sutton, Graeme Arnison and Finn Arnison. He was predeceased by his wife June Evelyn (Kirk) and his parents Fred and Frances (Madge) (Watson) Arnison.

Ron was born March 16, 1932, in Vancouver, where he spent his early years. Family camping trips to Shuswap Lake ignited a lifelong love of the outdoors, later expressed in camping and fishing trips with his own family and hunting trips with friends.

Ron and June, friends since high school, became an item at UBC where he was studying civil engineering and she was in home economics. They married on October 31, 1955. Following the birth of two daughters, they travelled and lived in northern BC. In 1958, they moved to Banff, where their son was born, and from there to Jasper where they had their fourth child. Later moves included Saskatoon, Ottawa, and finally Edmonton.

Most of Ron's career was spent with the federal Department of Public Works. Later, he was responsible for the management of federal buildings in western Canada. He finished his career as the project manager for the construction of Canada Place in Edmonton. Once retired, Ron took up golf and accompanied June while she indulged her passion for history, genealogy and the collection of antique patterned glass. Together, they travelled to over 20 US states.

Ron loved being a grandad and had a special relationship with and place in his heart for each of his five grandchildren. Most of all, Ron was a soul mate, best friend, lifelong companion, and finally caregiver, to his wife June. His devotion to her, and hers to him, was an inspiration. All who knew him refer to him as a true gentleman. His family knew him as a very good man, with a twinkle in his eye, a perceptive sense of humour, and great hugs.

Theo G. Bell Irving, ***BCom'52***

June 23, 1930 – June 7, 2018

Theo died in Qualicum Beach on June 7, 2018. She was predeceased by her parents, Dora and Norman Gyles. Theo is survived by her husband D. Harry Bell-Irving; her children Sara Olivotto (Ivo), Jan Bell-Irving (Chris Dahl), Malcolm Bell-Irving (Wendy), Tori Purdon (Toni); her grandchildren Theodora, Kathleen, Michael, Nicholas, Fraser, Maddy, Christopher and Claire; her great grandchildren Alexandros, Nikolas, Andrew, Emma; and her brother David Gyles (Bev). Theo graduated from UBC in 1952 with a Bachelor of Commerce, where she was one of the few women in her graduating class, and went on to work as a statistician with William M. Mercer. She participated in the community by volunteering on fundraising drives for a number of charities. Theo loved art and, for years, volunteered at the Vancouver Art Gallery Store and subsequently at the store for the UBC Museum of Anthropology. Theo was kind, gracious, and patient, and will be remembered for her gentle, loving nature. A celebration of Theo's life was held this past summer at Qualicum Beach.

Robert Gilliland, ***BA'59, BSW'66, MSW'67***

Robert (Bob) Gilliland was born on November 26, 1935, in Toronto General Hospital, to Douglas and Gladys Gilliland. Bob had a younger brother, Doug, and the family grew up in Toronto, Montreal, Calgary, and finally Vancouver.

Bob graduated from King Edward High School in 1954, and at UBC earned his BA in Criminology and Psychology ('59), Bachelor of Social Work ('66), and Master of Social Work ('67). He completed his studies in 1987 with a PhD in Psychology from Pacific Western University. He met and married the love of his life, Gwyneth Witney, in 1961, and they had three sons: Brian, *BASc'85*, Stephen, and James (Jim), *BCom'93*, former chair of the Faculty Advisory Board for the Sauder School of Business. Bob was a man of many passions and pursuits. He was a UBC professor; a pioneer of many therapeutic methods; a student of shamans; a practitioner of Tai Chi; and a chainsaw bear carver. He was a free spirit with a great sense of humour and spent his final days visiting friends and family, joking, and laughing.

On the evening of August 14 in his home, Bob passed away peacefully with his family at his side. In lieu of flowers, donations to the BC Cancer Foundation would be appreciated.

Edmund (Ted) W. Howard, ***BSF'58***

After a long and healthy life, Ted passed away on October 22, 2017, at the age of 86. He was born in Calgary, where he attended Strathcona-Tweedsmuir School, and went on to St. Michaels University School in Victoria, BC. Ted received his BSF'58 from UBC and his master's in Forestry ('68) from the University of Georgia, USA. Shortly after graduating from UBC, Ted married Phyllis Thompson *(BA'59, UBC; MEd'76)* and moved to St. John's, Newfoundland, where Ted worked as a Research Scientist in Silviculture and Fire for Canada Department of Forestry. In 1974, missing the beauty and climate of BC, Ted and Phyllis with their children, Arthur *(BSc in Agriculture '85, UBC; MDiv'89; DMin'13)* and Jacqueline *(Dip. in Animal Technology '87; BSc in Zoology '98)*, moved to Vancouver where Ted had accepted the position of Forestry instructor at BCIT. In 1990, Ted retired and did some consulting work in forest fire behaviour for both a forestry college and a private company in South Africa.

Ted had a very full and satisfying life working in research and teaching; helping establish BCIT's Retiree Association, where he held multiple positions through the years; travelling extensively; researching his family history; gardening; and just enjoying his children and grandchildren: Jean May, Jonathan, Breyden and Jaryn. Ted will be greatly missed by all his family.

Edward Knight, ***BSF'50***

It is with great sadness that we announce the passing of Ted Knight at the age of 94. Ted is survived by Lavina, his wife of 66 years; his sons David (Cindy), Alan (Carley), Brian (Mary) and Keith (Luisa); grandchildren Lucy, Carolyn (Curtis), Peter, Bill and Christopher; and great grandchildren Max and Molly. Ted was born and raised in Vancouver, and, after serving in the Royal Canadian Air Force, graduated from UBC in 1950 with a degree in forestry. He had long, successful career with the BC Forest Service, retiring in 1985. His retirement years were spent tending his vegetable garden in Victoria as well as visiting and hosting his family. Ted was a loving husband, father and grandfather and will be missed by all of us.

Gordon A. Thom, ***BCom'56, MEd'71***

Gordon passed away on May 17, 2018, having lived a full and wonderful life. His kindness, sense of humour, and whole-hearted engagement in diverse activities enriched each of our lives. He will be lovingly remembered by his children Kathy, Graham (Michele) and Margot (Laurent); his siblings Baird and Patricia; and his grandchildren Dani (Craig and great grandson Avery), Durham, Natasha, Derek, Evan, and Lucas. Gordon was predeceased by his loving wife Helen of 60 years. He lived in Saskatchewan and Alberta before attending UBC in 1951, where he graduated with his Bachelor of Commerce in 1956, and was a member of the Sigma Chi Fraternity. Gordon and Helen moved to Northern BC to work with Imperial Oil in 1956. In 1958, he attended the University of Maryland to obtain his MBA and returned to Imperial Oil. He joined the UBC Alumni Association in 1962, where he worked until 1966. He obtained his MEd at UBC in 1971. Gordon began his cherished career at BCIT in 1966, joining as VP of Continuing Education, then serving as president (1974-85). He also served on the UBC Senate (1972-81 and 1987-93).

Helen Thom, BA'55, ***BSW'56***

Helen passed away on September 22, 2016, after a long struggle with cancer that she managed with incredible courage and dignity. She will be lovingly remembered by her husband of 60 years, Gordon; her three children, Kathy, Graham (Michele), and Margot (Laurent); and her brother, Edward Hurlston (Carol) and niece, Kim. She leaves to specially remember her, six grandchildren whom she adored: Dani (Craig), Durham, Natasha, Derek, Evan, and Lucas.

Helen had a very full and vibrant life with many cherished friendships. She lived most of her life in the Dunbar area and attended Queen Elizabeth Elementary, Lord Byng Secondary, and UBC, where she completed her BA and BSW. Her early career found her working in remote areas of Northern BC and then at an adoption placement agency in Vancouver. Later, after devoting her endless energy to raising her family, she completed her MA at SFU in 1982. She trained as an Orton-Gillingham tutor, teaching children with dyslexia and worked as a practicum advisor for tutor training.

David Donaldson, Professor Emeritus

Dr. Donaldson, 76, completed his dental degree in 1965 at the University of St. Andrews. He went on to receive his Fellowship in Dental Surgery through the Royal College of Surgeons in Edinburgh in 1969, and in 1971 was granted his master's degree in Restorative Dentistry by the University of Dundee. In 1970, he accepted an appointment at UBC in the new Faculty of Dentistry. David enjoyed and excelled at academia but also worked in private practice, specializing in treating chronic pain and TMJ pain management. Dentistry was his passion, and he would retire from UBC after 45 years of service as a distinguished professor emeritus, having held appointments as head of the Department of Oral Biological and Medical Sciences, head of the Department of Oral Surgery, and professor and head of the Division of Pain and Anxiety Control. He was also the past chairman of the Canadian Dental Association Council on Education, and past president of both the Association of the Canadian Faculties of Dentistry and the International Federation of Dental Education Associations.

Donald Roger McAfee, ***BA'62, LLB'67***

(1939-2018)

In 1959, Roger arrived at UBC from Ontario, having given up on professional hockey. He chose UBC because of its renowned theatre program, but majored in geography. He joined the Ubyssey as photo editor in 1959 and was the paper's managing editor and editor-in-chief from 1962-63, when he led a talented team to the Southam Trophy as Canada's best university newspaper.

In 1963, Donald entered law school at UBC and served as both president of the AMS and captain of the law school hockey team. As president, he renegotiated the planned design for the new student union building (SUB), tripling its size. After UBC, Roger served as a prosecutor in Vancouver and was in private practice for some 20 years. He later returned to journalism, contributing to Pacific Yachting and many other marine publications and publishing several books, including *The Warm Dry Boat* and *Fort Ross: The Ship in the Shadow*, reflecting a passion for the sea.

He leaves his wonderful wife, Melody Bell (*née* Miller), and other members of their extended families. A celebration of his life was held on October 13, 2018.

George Leslie Ross, ***BMus'67, MMus (Voice)'71***

It is with heavy hearts that we announce the sudden passing of George Ross, age 73. An unrepentant advocate for the importance of the arts in society, he had a profound effect on everyone who came into his sphere. His work in the Canadian arts scene and his broad knowledge of artistic disciplines were the delightful makings of what became a very large life. His reach and impact was felt nationally and abroad. More than a great friend, he was kind, gentle, joyful, supportive, patient, very resourceful, and "always there with a smile and a hug". In the 1970s, George's summers were spent working as a director, production and stage manager, and coordinator for the Opera program at the Banff Centre; his winters included a variety of freelance positions with opera companies in Vancouver, Edmonton, Calgary, Seattle, Portland, and Winnipeg. In 1978, George became manager of Theatre Arts at the Banff Centre, retiring in 2004 from the position of Associate Director, Operations. Not one to fully leave his work behind, George stayed active with Calgary Opera chorus and other theatre companies in Calgary, and remained a loyal patron of the arts.

Nora Paton, ***MEd'76***

Nora Ann Paton of Kenora, Ontario, passed away at the Lake of the Woods District Hospital on Monday, March 26, 2018. Online condolences may be emailed to *alcockfuneralhome@shaw.ca.*

Kate E. McInturff, ***MA'95, PHD'00***

Kate McInturff of Ottawa, age 49, died peacefully at home on July 27, 2018, following a three-year battle with colon cancer. Born in Seattle, Washington, in 1968, Kate graduated with a bachelor's degree from the University of Washington and a master's and PhD from UBC. After serving as an instructor at the American University of Cairo (Egypt) and assistant professor at McMaster University, she moved to the University of Ottawa and in 2007 became a Canadian citizen. Kate subsequently worked at Peacebuild, the Canadian Feminist Alliance for International Action, and Amnesty International, then served for five years as a senior researcher at the Canadian Centre for Policy Alternatives (CCPA). While at CCPA, she served on the United Nations Advisory Group on Inequalities and the Coordinating Committee of Social Watch.

Reflecting her lifelong passion for women's rights and gender equality, Kate achieved national acclaim for researching, writing, and producing CCPA's annual report, *The Best and Worst Places to be a Woman in Canada (policyalternatives.ca/best-worst2017)*. Her life's work was recently summarized in a posthumous profile in Maclean's. In August, Kate posthumously received the Karen Takacs Award for Women's Leadership in International Development, and in November she was recognized by the Women's Executive Network as one of Canada's Top 100™ Women.

Kate is survived by her son Rowan Salter, age 13, her former husband Mark Salter, *PhD'99*, her parents, innumerable friends and colleagues, and the women of Canada. Kate requested that donations be made to CCPA, where a fellowship in her name is being established as part of the Making Women Count initiative.

The Rev. Canon Douglas E. Williams, ***BA'17***
October 9, 1938 – December 19, 2017

The Rev. Canon Douglas Elliott Williams died peacefully, in his 80th year, on December 19, 2017, in Vancouver, BC. The only son of Keith S. and Elizabeth D. Williams of Oxnard, California, he was born October 9, 1938, in San Bernardino, California.

He is predeceased by his eldest son, Zephyr Starwater Grayston (Gregory Donald) Williams (Surajit Bose) of Palo Alto, California, and his brother-in-law, The Rev. Dr. Donald E. Grayston. He is survived by his wife of 54 years, Helen M. (Grayston) Williams; daughters Catherine A. Hall (Anthony) of Greenwich, CT, and Melody V. Williams of Stockton, CA; son Ian C. Williams and fiancée, Kristen L. Elliott of Kirkland, WA; granddaughters Elana A. Voigt (John Ryan) of Bremerton, WA, Brittany E. Ridgeway (Horatio) of Sacramento, CA; Haley V. Fowler of Stockton, CA, and great-grandchildren, Tristan and Milani Ridgeway.

He was educated at the University of California, Los Angeles, in Philosophy; the Cuddesdon Theological College, Oxfordshire, UK; the General Theological Seminary, New York City; and most recently at UBC for a degree in classics (Latin) and medieval studies. As an Anglican/Episcopal priest, Douglas served in the Diocese of Los Angeles, Diocese of California, and Diocese of El Camino Real, retiring as Canon Precentor of Trinity Cathedral, San José, CA, before retiring to Vancouver in 2000. In the Diocese of New Westminster he served as honorary assistant in the parishes of Christ Church Cathedral, St. James', and St. Anselm's.

Donations in memory of Douglas may be made to the Vestment Fund of Christ Church Cathedral, 690 Burrard Street, Vancouver, BC, V6C 2L1.

Obituaries are included in our biannual print issues, usually published in May and November, and should be 1100 characters (about 300 words) or less. Please send original photos by post or attach high resolution images to your online submission. Tributes may be edited for length and clarity where necessary. Note that print issues of the magazine are also published online.

There is no fee for submission.

Due to the high number of submissions, we are unable to guarantee publication in the next print issue. If you would prefer your submission be included in the next applicable online issue in lieu of print, please select that option on the form.

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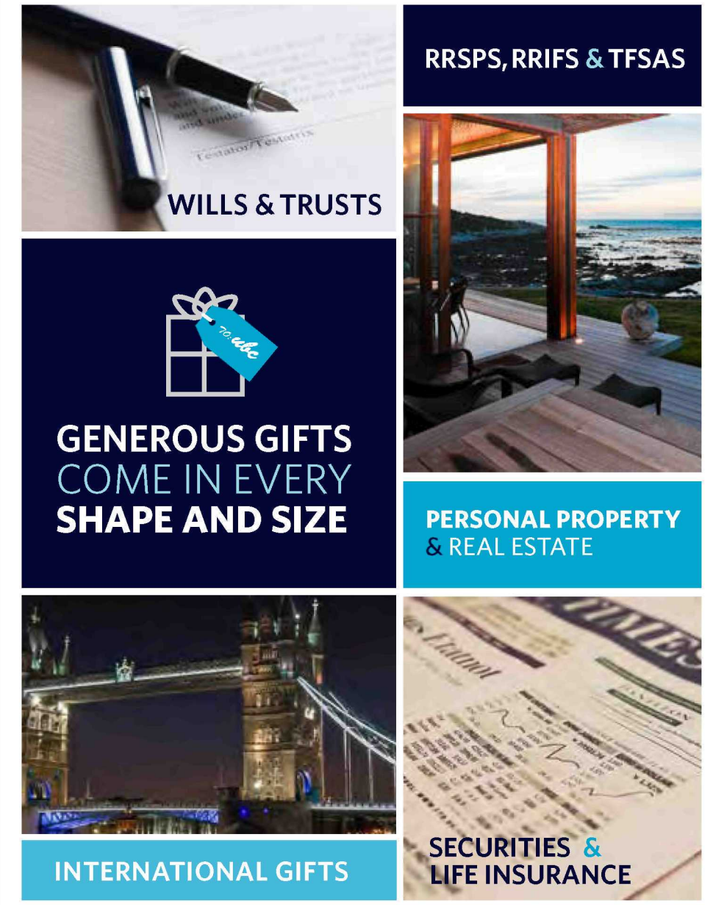

THE LAST WORD WITH *Robin Gill*, BA'93

What is your most prized possession? *My home, which is also my sanctuary.*

Who was your childhood hero? *My mom and dad.*

Describe the place you most like to spend time. *At a dinner party with interesting and interested people.*

What was the last thing you read? *Today's* New York Times.

What or who makes you laugh out loud? *Witty, dark comedies.*

What's the most important lesson you ever learned? *Once a liar, always a liar. They exist in all facets of life, whether personal or professional. If your gut tells you they're lying, it won't get better. They'll continue to lie because that's often all they know.*

What's your idea of the perfect day? *Lunch with my best friends when I get to see them in Toronto.*

What was your nickname at school? *I didn't have a nickname until I got into the news industry. A colleague started calling me Giller back in 1997 and it has stuck ever since. Now even senior executives call me that.*

What would be the title of your autobiography? *My Climb to Complacency*

If a genie granted you one wish, what would it be? *Win the lottery so I can do whatever I want, whenever I want.*

What item have you owned for the longest time? *Pearl earrings that my grandmother gave me when I was 16 years old. I still wear them because they remind me of her.*

Whom do you most admire (living or dead) and why? *My parents. They worked so hard under difficult circumstances as newcomers to this country just so we could have a better life. I hope we have made them proud.*

What would you like your epitaph to say? *Focus. (It is an expression I use to underscore when I'm trying to make a point, so my friends will get it.)*

If you could invent something, what would it be? *A machine to cure every disease.*

In which era would you most like to have lived, and why? *The Sixties, because it was such an era of change with the civil rights movements.*

What are you afraid of? *Childbirth and dying. It just seems so painful.*

What is your latest purchase? *A Chanel purse. It was indulgent on my part but I love classic pieces that last decades.*

Name the skill or talent you would most like to have. *I wish I could draw or paint. I am constantly in awe of people who have this amazing talent. Artists are an important part of our society.*

Which three pieces of music would you take to that desert island? *Beethoven's "Fur Elise," David Bowie's "Golden Years," and Marvin Gaye's "Mercy Mercy Me."*

Which famous person (living or dead) do you think (or have you been told) you most resemble? *A colleague once told me that I looked like the women in Modigliani paintings. When I was a teen, I was told I looked a bit like Isabella Rossellini. I don't think I look like any of them, but I couldn't be more flattered.*

What is your pet peeve? *Stupidity. People need to really think before they speak or send that email, because it will mark you for life.*

What is the secret to a good life? *Take chances. You never know where they'll take you.*

Do you have a personal motto? *Don't settle for less.*

What's the most important thing left on your bucket list? *There are too many to list.*

What are your UBC highlights?
– Reading Foreign Affairs *and* The Economist *in the library stacks.*
– Hanging with friends at Sedgewick Library (and they're still part of my close circle to this day. We meet once a year for dinner and still laugh about the silly things we did in school).
– I graduated with a degree in International Relations. It was such a fascinating and enriching program. To this day, that knowledge has stayed with me and is so applicable in the work I do.

Robin Gill always knew she would be a journalist.

"This was the only thing I ever wanted to do," she says. "My family was big on reading newspapers and watching the news every single night, and we would watch it as a family, so it was ingrained in me."

It's all about telling a good story, says the *Global National* weekend anchor and BC correspondent, "one that's relevant, current and matters to people."

Gill majored in international relations at UBC and was seriously studious. "I loved my major," she says. "I would spend hours in the stacks reading *Foreign Affairs* magazine and *The Economist* because they were so expensive I couldn't afford to get the subscription." The Pit pub, on the other hand, she tended to avoid. "I just couldn't stand the smell of beer on the floor," she says, while conceding "they did do a great burger."

Gill, who describes herself as a "fairly private person," began her career as a writer and researcher, and initially saw herself progressing to another behind-the-scenes role as a producer. "Along the way," she says, "I worked with producers and news directors who said I should be in front of the camera."

Now a national news anchor, Gill is a familiar face to millions of Canadians, with the result that her job can sometimes encroach on her private life. But a lot of the time her anonymity remains surprisingly intact. "People come up to me and say, 'Did I go to university with you?' They can't quite place me."

Gill says she thrives on breaking news, finding an oasis of calm amongst the chaos rather than succumbing to the stress. It's the deadlines that kill her. "We have very tight deadlines and you are constantly feeding the beast. You never get over the anxiety of it – the heart palpitations – if something goes technically wrong and your story doesn't make its slot, and you're flying by the seat of your pants."

Another source of stress can be the stories themselves, the harrowing ones that involve human pain and loss. "You do absorb some of it," she says. "It can be very emotional, and it can be very draining."

For that reason, she's keen on maintaining a healthy work-life balance. "I have a huge circle of friends – many different circles – so it's about making time to spend with them.

"Some of my closest friends are from my UBC days. We all meet for dinner once a year and we still talk about the stupid crazy things that we did back then. Not that I'm ever going to reveal what we did."

Some stories are best left untold.

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