WINTER 2012 | VOLUME 1

UNIVERSITY OF MANITOBA

ResearchLIFE

Star Search

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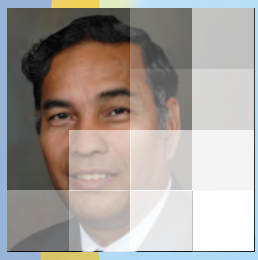
- THE GAME OF LIFE

Message

FROM THE VICE-PRESIDENT (RESEARCH AND INTERNATIONAL)

"The important thing in science is not so much to obtain new facts as to discover new ways of thinking about them."

— Sir William Lawrence Bragg



Wise words from the late Nobel laureate hold true today for scientists and researchers in every discipline around the globe as these did in the past. This is very much the essence of what the many innovators, pioneers, mavericks and visionaries at the University of Manitoba embrace every day.

Exploring the known and testing that knowledge with a different outlook, seeking answers to critical challenges we face today and in the future is the goal of research at the University of Manitoba.

Our cover story, Star Search, featuring Samar Safi-Harb, exemplifies the excellence and breadth of research conducted within our walls that explodes out into the universe and back again. Landscape architect Brenda Brown, who is constantly listening to landscapes in her research and design, hears and responds with a complementary voice. Robert Schroth is dedicated to improving access to much needed dental care for at-risk children in the inner city areas of Winnipeg.

Turn the pages of this magazine and join our explorers and visionaries who are making an impact at home and around the world.

—Digvir S. Jayas, PhD, PEng, PAg

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Inside

STAR SEARCH

Astrophysicist Samar Safi-Harb is one of three Canadian researchers participating in a satellite mission that will explore extreme cosmic phenomena for evidence of life's origins. BY CURT CHEREWAYKO

ResearchLIFE

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MS RESEARCH BOOST

PFIZER CANADA INC.'S GLOBAL RESEARCH DIVISION is funding the study of the neurological disabilities and sensory abnormalities that are hallmarks of multiple sclerosis (MS). The research is headed by associate professor Michael Namaka and professional associate Emma Frost, both of the university's cellular neuroscience research team in the Faculty of Pharmacy.

The new research study is a natural progression for Namaka, whose past research has focused on MS and pain.

"We are very pleased to support this important work that will contribute to our knowledge of how multiple sclerosis causes the symptoms it does, thus possibly showing new ways to develop and target new treatments," said Paul Lévesque, president of Pfizer Canada. The company is one of the country's largest investors in healthcare research, and this is one of their largest investments in 2011 in Western Canada.

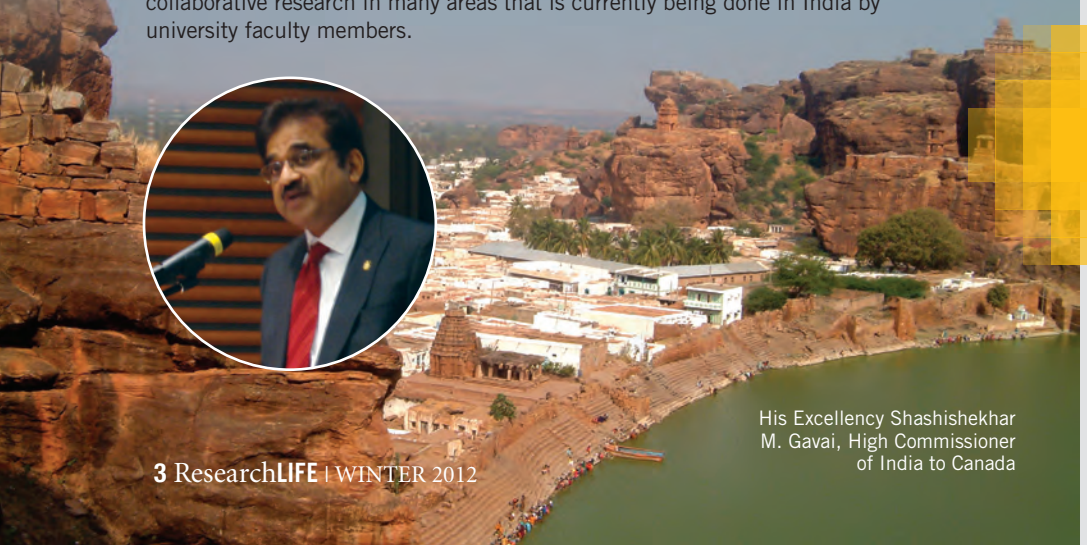
Factors being studied now and over the next 18 months will include how a substance called fatty acid amide hydrolase impacts the development of MS-like symptoms in mice and rats.

YEAR OF INDIA IN CANADA

THE HIGH COMMISSIONER OF INDIA to Canada rolled into Winnipeg in October and he did not come alone. Kicking off a weekend full of events was a night of musical entertainment and dancing; a Bollywood musical sandstorm. Ila Arun, and her troupe of 39, performed for the first time in Winnipeg. Arun is an internationally known actress, playwright, poet, lyricist and reality television star.

This coming together of traditional Indian music, food, and entertainment was a well-suited segue into the Manitoba-India Symposium. The 'Celebrating Manitoba-India Cooperation in Higher Education: Academic Symposium,' welcomed His Excellency Mr. Shashishekhar M. Gavai, High Commissioner of India to Canada. Gavai spoke about the rapid and growing collaboration between the two countries, India and Canada, specifically highlighting the University of Manitoba's collaborations.

"Our hope is that a year or two from now, we will look back on this forum and see that the outcomes of our discussions are being realized all around us," said University of Manitoba's vice-president (research and international), Digvir Jayas. The symposium presented the university with the opportunity to share, with its Indian partners, collaborative research in many areas that is currently being done in India by university faculty members.



His Excellency Shashishekhar M. Gavai, High Commissioner of India to Canada

MAKING A DIFFERENCE

TWO NEW PROJECTS ARE UNDERWAY at the Manitoba Centre for Health Policy (MCHP) and both will employ evidence-based health research and population health data to inform policy decisions.

The 'PATHS Equity for Children' project led by MCHP director Patricia Martens, will receive $1.9 million over five years to study the gaps, and inequities in the health of children and youth in Manitoba and to assess the results of multiple programs and policies introduced in the past 10 years to find 'what works' when dealing with the health of our province's youngest citizens.

"At provincial and national levels, policies and programs are developed to reduce health and social inequity," said Martens. "This new five-year study will determine which Manitoba programs have improved overall outcomes, but more importantly, verify which ones narrowed the gap and those that widened the gap in child health inequity."

It is estimated that nearly 10,000 Canadians die each year and 150,000 are hospitalized as a result of adverse drug reactions. Drug costs have risen six-fold over the past 20 years and make up a significant portion of health care budget expenditures across Canada.

The Manitoba branch of CNODES (Canadian Network for Observations Drug Effect Studies) will examine drug safety and effectiveness in Manitoba. Patricia Martens is the co-principal investigator for the Manitoba group along with Patricia Caetano of Manitoba Health. The project will receive $1.975 million over four years and is part of the Drug Safety and Effectiveness Network Initiative led by Samy Suissa of the Jewish General Hospital in Montreal.

The PATHS and CNODES projects are funded by the Canadian Institutes of Health Research.

TREATY TALK

ON THE HEELS OF THE UNIVERSITY'S STATEMENT of apology and reconciliation, on the subject of the Indian Residential School System, the Royal Society of Canada (RSC) Governor General's lecture series 'We are all Treaty People: Accepting the Queen's Hand' was hosted by the university in early November.

During his welcome remarks, the university's president and vice-chancellor David Barnard spoke about the recent apology. "I made a statement of apology on behalf of the university to the Truth and Reconciliation Commission pointing really to a failure, a very large failure in our relationship with Indigenous people," said Barnard. "We need to learn from our mistakes so we don't repeat them and we want to ensure that economic issues, social justice issues are addressed throughout our community, our province and our country.

Guest lecturer Jim Miller, Canada Research Chair in Native-Newcomer Relations at the University of Saskatchewan, has broken new ground with a series of studies on government and church policies towards Aboriginal people. Over the last four decades, there has been a tradition of treaty making between Aboriginal peoples and the Crown, both in pre- and post-confederation Canada. This tradition began with early commercial compacts and peace and friendship treaties in eastern Canada that formed the foundation for these agreements.

LEGENDARY HEARTS GATHER

SOME OF THE WORLD'S BIGGEST LEGENDS in heart health and care came together in Winnipeg, just this past October, for the Winnipeg Heart International Conference. The Institute of Cardiovascular Sciences, a joint institute of the University of Manitoba and St-Boniface Hospital Research, was set to celebrate their 25 year history of cardiovascular sciences research and couldn't think of a better way to do so than by hosting a meeting of heart researchers in the 'heart of the continent,' Winnipeg. The public were invited to hear firsthand about exciting developments in the field of cardiovascular sciences at two public forums. Hundreds of cardiovascular scientists from around the globe attended the conference.

The institute is recognized worldwide as a leading force in the fight against heart disease at the cellular and molecular levels. More than 80 multidisciplinary researchers approach their investigations in areas of cardiac pathophysiology, electrophysiology, cellular and molecular biology.

HEALTH AND HOUSING

HEALTHY, AFFORDABLE HOUSING is a primary concern for people living in Canada's North, but not one that is being recognized by the greater parts of our nation. Extreme weather and social conditions are contributing to poor housing conditions in many First Nations communities, threatening the health and safety of residents.

Civil engineering professor Dimos Polyzois is well on his way to address these problems, thanks to a $475,050 research grant from the Collaborative Health Research Projects (CHRP) program.

Polyzois is leading a research team made up of colleagues at the University of Manitoba (Linda Larcombe, Pamela Orr, Kris Dick, Marolo Alfaro) and The University of Winnipeg (Eleoussa Polyzoi) in developing a protocol for Northern Manitoba First Nations housing to meet acceptable healthy and sustainable housing standards. They will study the link between housing conditions and health, and the impact on children's health and academic performance.

"This project creates an enormous challenge for us that we are well prepared to assume. It gives us a unique opportunity to make a difference in the lives of First Nations people," said Polyzois.

The CHRP program is new and jointly funded by two of Canada's federal granting agencies: the Natural Sciences and is Engineering Research Council of Canada and the Canadian Institutes of Health Research. The program supports research projects which aim to improve the health of Canadians, Canadian health services, and/or economic development in health-related areas.

(l-r) Craig Milligan and Nicole Lovat

Daniel Gwozdz

SCHOLARS SHINE

Graduate students at the University of Manitoba are making a name for themselves by tackling some critical issues with the financial support of Canada's top research award.

Nicole Lovat (pharmacology and therapeutics) and Craig Milligan (civil engineering) are among the trailblazing recipients of 2011's Vanier Canada Graduate Scholarships (CGS). They were chosen based on their exceptional leadership skills and high scholarly achievement, both students boasting a GPA of well over 4.0 in their undergraduate and graduate studies. Among numerous distinctions and awards, Milligan has won a gold medal in civil engineering while Lovat has a patent on file.

Lovat is examining ways to minimize the risks associated with the pre-diabetic state experienced during pregnancy. Pre-diabetes during pregnancy is a natural phenomenon that could progress to diabetes if insulin levels are incapable of regulating post-meal blood sugars. Lovat is testing an antioxidant cocktail's effectiveness in treating this condition in a rat model. The results of this research will determine the suitability of a randomized control trial in the pregnant human population.

Milligan's research includes measuring and gathering data on a variety of factors that affect northern transportation performance such as: highway and bridge conditions, cost effectiveness, reliability, sustainability and environmental quality. This research will allow him to develop the tools needed by engineers and planners when making future investment decisions related to Canada's northern transportation systems.

The CGS is Canada's top graduate research award and highlights some of the most significant research presently being conducted across the country that will have significant benefit to Canada's economic competitiveness, environment and quality of life.

Vanier Scholars demonstrate leadership skills and a high standard of scholarly achievement in the social sciences and humanities, natural sciences and engineering, and health-related fields. Canadian and international students are eligible to be nominated for a Vanier Scholarship, which is valued at $50,000 per year for up to three years.

SMALL CELLS... LARGE IMPACT

Animal cells have a lot to say and a newly appointed Canada Research Chair (CRC) is going to tell us all about it. Jason Treberg, the new CRC in Metabolism and Environmental Dynamics, will examine the role of mitochondria in metabolic and physiological responses to environmental change and quality.

His goal is to integrate how 'large scale' environmental factors outside an animal impact processes internally at the mitochondrial level. Responses at the 'small scale' mitochondrial level may limit the whole animal responses to challenge and their ability to survive and adapt.

Lorrie Kirshenbaum, CRC in Molecular Cardiology and principal investigator at the Institute of Cardiovascular Sciences, a joint institute of the University of Manitoba and St-Boniface Hospital Research, had his chair advanced from a Tier 2 to a Tier 1, allowing him to build on the research he has conducted thus far and speaks to the university's commitment to advancing and retaining world-class researchers.

Colleagues who had their CRCs renewed include: Trust Beta (CRC in Food Processing for Grain-based Functional Foods), James Davie (CRC in Chromatin Dynamics), Ehab El-Salakawy (CRC in Advanced Composite Materials and Monitoring of Civil Infrastructure), Mostafa Fayek (CRC in Isotope and Environmental Geochemistry), Andrew Halayko (CRC in Airway Cell and Molecular Biology), Kiera Ladner (CRC in Indigenous Politics and Governance), Aaron Marshall (CRC in Molecular Immunology), Mario Tenuta (CRC in Applied Soil Ecology) and Quan (Abraham) Wang (CRC in Solid Mechanics). With the addition of Treberg, the U of M now holds 44 CRCs.

PIONEERING TRIO

IT'S BEEN SAID THAT GOOD THINGS happen in three's but in this case, they happen to three different pioneering academics. They've all made contributions in a variety of ways but the thread that binds the trio is their demonstrated leadership, creativity, distinctive competencies and commitment to advance academic health sciences.

Stephen Moses, Brian Postl, and Noralou Roos—all Faculty of Medicine faculty members—were recently elected as fellows of the Canadian Academy of Health Sciences.

Moses (medical microbiology) has made major contributions internationally to understanding biological and behavioural risk factors for sexually transmitted infections, particularly HIV infection, and translating research findings into practice.

Postl (dean of the Faculty of Medicine) is a distinguished senior pediatrician and

1

2

3

Stephen Moses
Brian Postl
Noralou Roos

academic physician who has contributed significantly to the health and welfare of children, particularly in Northern communities, through his active efforts in developing patient-based programs with a community health perspective.

Roos (community health sciences) co-founded the Manitoba Centre for Health Policy in the early 1990s and helped develop the Population Health Data Repository. This system allows researchers to examine the social determinants of health and the efficacy of the healthcare system.

Annemieke Farenhorst, the prairie region's new (NSERC) Chair for Women in Science and Engineering.

WANTED: WOMEN IN SCIENCE & ENGINEERING

Annemieke Farenhorst, professor of soil science in the Faculty of Agricultural and Food Sciences, has been named the prairie region's new Chair for Women in Science and Engineering by the Natural Sciences and Engineering Research Council of Canada (NSERC). She plans to address the level of participation of women in science and engineering as students and professionals in the prairie region.

The program is designed to help remove barriers and encourage women to bring their unique perspectives and talents to bear on today's challenging problems. It was Farenhorst's focus on the need of Aboriginal girls and women in science and engineering that really struck a chord with the selection committee.

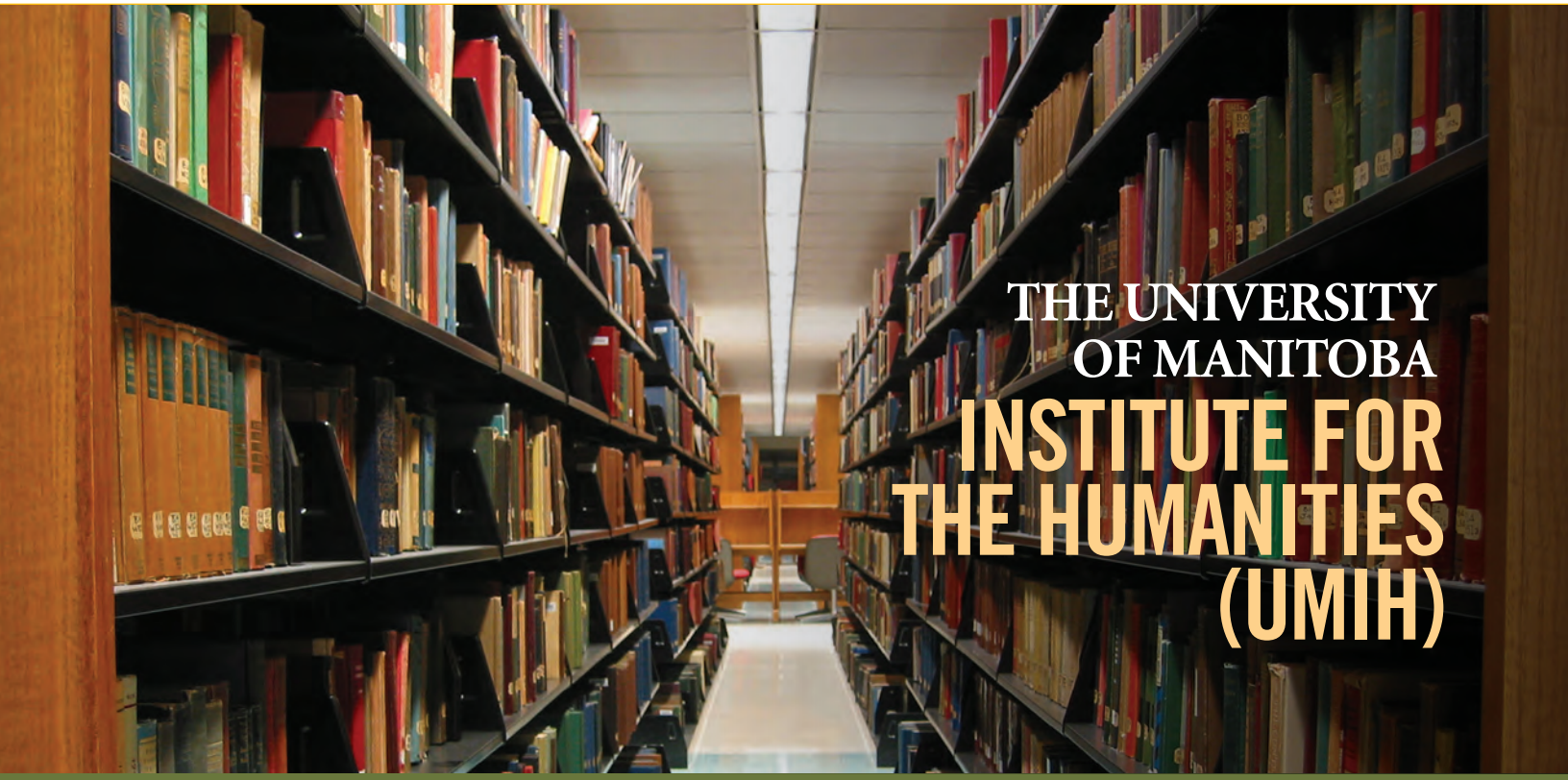
Farenhorst will receive a total of $1.4 million in support over the next five years from NSERC and the additional funding partners: Manitoba Pork Council, University of Saskatchewan, Province of Manitoba, Association of Professional Engineers and Geoscientists of Manitoba, Manitoba Institution of Agrologists, Canadian Society of Soil Science, the Faculty of Agricultural & Food Sciences and the U of M.

PUBLIC LEGACY

With each change of hat over the course of his career—dean of medicine, deputy health minister, board chair of the Winnipeg Regional Health Authority and many other leadership positions on provincial and national boards—John Wade has certainly fulfilled the need for creative, highly skilled individuals in the public sector.

His long-standing interest in public administration earned him the 2011 Lieutenant Governor's Medal for Excellence in Public Administration, awarded by the Institute of Public Administration of Canada.

Wade, a highly regarded physician, was first appointed chair of anesthesia by the University of Manitoba early on in his professional career. Alongside his mentor, John 'Jack' Hildes, Wade was one of the first physicians to travel up north during a time when surgeries for northern residents were solely performed in Winnipeg. This insightful experience was one that influenced him significantly and as the U of M's dean of medicine from 1982-88, Wade established the ACCESS Program. With a mandate to encourage Aboriginal students to attend medical school (and other professional programs) the ACCESS program has broken down barriers and provides supports to encourage Aboriginal students to enter and succeed at medical school and in other professional programs offered at the University of Manitoba.



THE UNIVERSITY OF MANITOBA INSTITUTE FOR THE HUMANITIES (UMIH)

THE UNIVERSITY OF MANITOBA INSTITUTE for the Humanities (UMIH) was established in 1990 to foster research and scholarship in the humanities at the University of Manitoba, to promote interdisciplinary research in the humanities, and to help obtain external funding for humanities research.

Though always modest in scale, the UMIH has made a tremendous contribution to the intellectual and collegial life of the Faculty of Arts and the university as a whole—managing international conferences, sponsoring colloquia and themed series of research talks with both guest speakers and U of M faculty members, assisting graduate students with research projects, and providing an institutional base for researchers.

In its twentieth year the institute took the opportunity to do more than look back over the institute's past accomplishments. The UMIH director David Churchill, along with Shelley Sweeney, head of university archives and special collections, were awarded a two year grant from the University of Manitoba Academic Enhancement Fund for a 'Lesbian, Gay, Bisexual, Transgender, and Two-Spirited (LGBTT) Archival and Oral History Initiative.'

This initiative has dramatically enhanced the LGBTT resources at the university and will ultimately make the university a centre for research excellence in the interdisciplinary field of LGBTT studies. Many of the related archival materials—currently deposited with the university archives and special collections—deal with the decades long struggle by LGBTT people and communities for human rights, social justice, and dignity. Collecting LGBTT archival materials including the records of organizations, relevant periodicals, and individual oral histories, is all part of the larger project of witnessing and remembering, which are cornerstones for the establishment, protection, and expansion of human rights.

Continuing the institute's long standing commitment to supporting and training students, during the summers of 2010 and 2011 several University of Manitoba graduate students were trained as researchers, and spent the summers interviewing people from the LGBTT community. The materials were transcribed and transferred to the university archives and special collections.

The institute continues to maintain and enhance its direct support of interdisciplinary research through the research cluster program. Research clusters are groups of faculty members and graduate students from a variety of different departments and disciplines who share research interests. For the academic year 2011-12 UMIH is supporting two clusters: 'Power and Resistance in Latin America,' and 'Film Worlds.'

It should be noted that the two decades of the UMIH's existence have not been the easiest of times for humanities scholars. Across North America scholars in literature, philosophy, history, classics and other humanities departments have come under criticism for their relevance and utility. The UMIH has sought not only to illustrate contemporary relevance, but also to provide space for scholars whose research programs are not simply epistemological instruments. Intellectual diversity is the key to a dynamic educational and research environment; something the UMIH continues to build and nurture.

To learn more about the UMIH go to <umanitoba.ca/faculties/arts/departments/humanities> ■

ONEmind

DR. CHAD GAFFIELD

PRESIDENT OF THE SOCIAL SCIENCES AND HUMANITIES RESEARCH COUNCIL OF CANADA (SSHRC)

Dr. Chad Gaffield was appointed president of the Social Sciences and Humanities Research Council of Canada (SSHRC) in September 2006 and reappointed for a second term in 2011. As president of SSHRC, he has helped define a new model of innovation that places understanding about people—human thought and behavior—at its core, and that reaffirms the contributions of social sciences and humanities research to our economy and quality of life. Gaffield is one of Canada's foremost historians and was founding director of the Institute of Canadian Studies.

Prior to his appointment to SSHRC, Gaffield was a professor at the University of Ottawa for two decades. He has won many awards for his teaching, research and innovative theories and methods related to computer-based, interdisciplinary and multi-institutional collaboration. He is the recipient of the Queen's Golden Jubilee Medal in 2003 and the inaugural winner of the Antonio Zampolli Prize, awarded by the Alliance of Digital Humanities Organizations to recognize a single outstanding output in the digital humanities by a scholar at any stage in their career.

MANY insights

What follows is an excerpt from a conversation with Chad Gaffield:

At the heart of research is the desire to learn about ourselves and the world around us—an ambition that is, I think, a defining characteristic of human beings. Who are we? How do we make sense of our lives? How can we make a better future? While such questions have long histories, they are now being pursued in new ways that both build upon and reject assumptions about how to learn about the past and present.

Researchers are expanding their strategies for advancing knowledge and understanding by embracing both disciplinarity and interdisciplinarity, by collaborating within campus-community partnerships and by replacing the teaching-research dichotomy with new approaches to inquiry-based learning. These developments reflect the re-imagining of scholarship in the digital age—a profound change that is inspiring and challenging for all of us.

My career as a historian made me increasingly aware of the importance of human decisions. The present is certainly not an inevitable product of the past. But why do people think and behave in such similar and different ways? For many centuries, this question was not considered an important focus for research but it is now seen to be central to our efforts to enable meaningful lives and build successful societies in the twenty-first century.

What is so energizing in research today is the promise of creating a better future. Research informs our understanding, as a society, of where we've been, where we are now, and the unending possibilities. In recent decades, we have benefitted from many research efforts to confront societal challenges. For instance, SSHRC-funded research since the early 1980s has led to new forms of elder care, new retirement policies and renewed pension plans to help Canada adjust to our aging population. The University of Manitoba has played a central role in this research, especially at the internationally-renowned Centre on Aging. While we are only beginning to understand the process and implications of aging individuals and societies, the steps taken so far illustrate the enormous value of understanding human thought and behaviour.

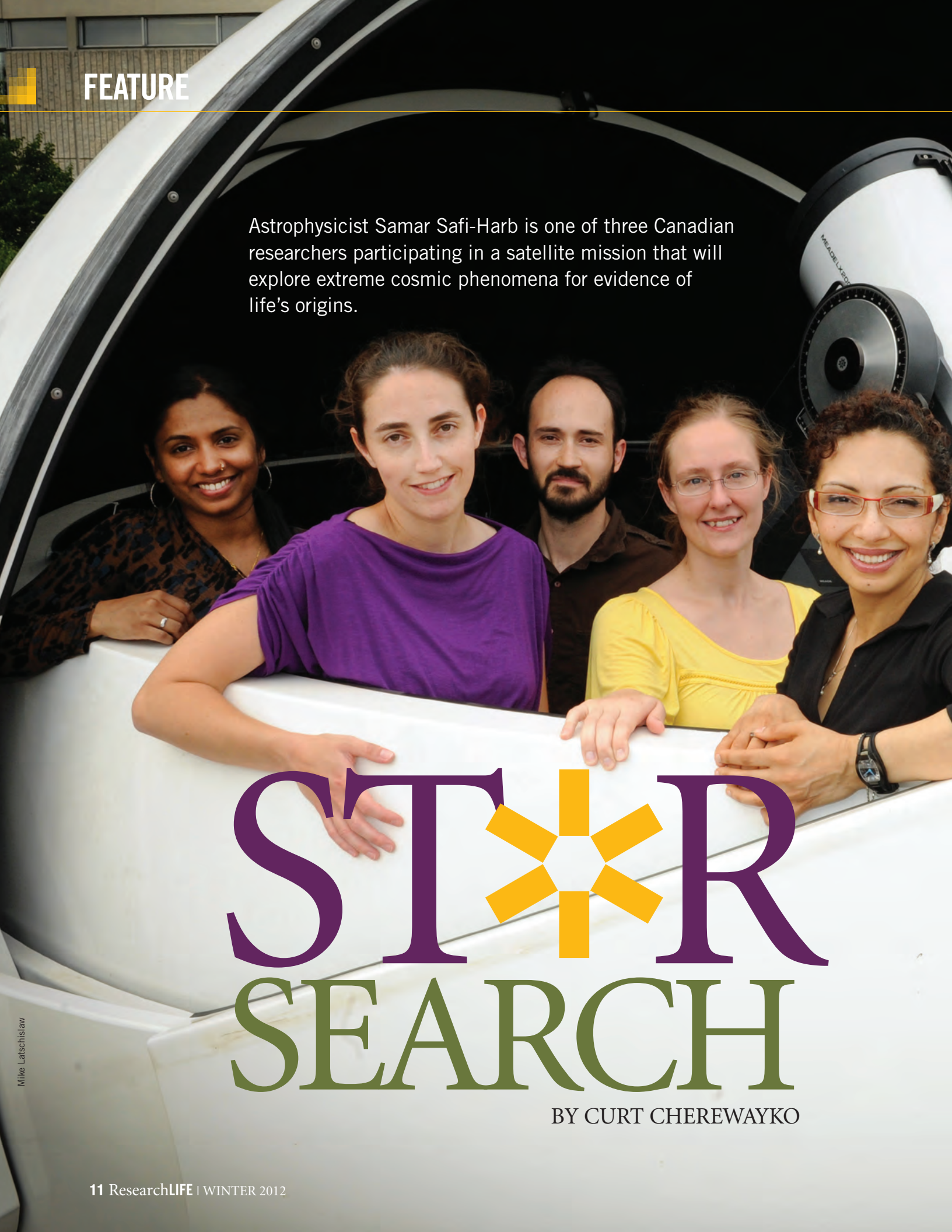
Research has been transforming the experience of "growing up" as we gain greater insight into the complex dynamics that intertwine individuals, families, and communities. Historians revealed the unfounded assumptions about children as 'miniature adults' while sociologists have been showing the long-term consequences of bullying and psychologists have identified the first years of life as crucial for positive experiences in subsequent years.

Such examples explain the development of new policies and practices for successful parenting, schooling, physical development, and integration into the labour force. In similar ways, we have become increasingly focused on enhancing the experience of new scholars through initiatives to support their development as productive and engaged professors who contribute to the positive experience of students, colleagues, and others on campus and beyond.

Not that long ago, we had assumed that technological invention and innovation was the key to productivity and economic growth which would then pay for education, health and welfare. We now recognize that this linear lab-to-market assumption underestimated the extent to which people—human thought and behaviour—must be placed at the center of our efforts to build a better future. Indeed, research is now showing how technology becomes significant only through its use.

Moreover, increased productivity and economic growth are now recognized to be intertwined with successful schools, healthy environments, and adequate care for those in need. The result is a new people-centred model of innovation for building successful societies.

It is often assumed that humans are preoccupied with the present; in fact, we worry far more about the future. We now recognize that our decisions today have long-term consequences not only for ourselves but for our descendents and their descendents. The result is that people want to make the best decisions possible. Better understanding of the past and present certainly do not guarantee a successful future but they offer the best prospects for building productive and prosperous, resilient and safe, ethical and just societies in the 21st century. This is the kind of society we believe Canadians want to live in—and we, at SSHRC, are doing all we can to help make that a reality.



Astrophysicist Samar Safi-Harb is one of three Canadian researchers participating in a satellite mission that will explore extreme cosmic phenomena for evidence of life's origins.

STAR SEARCH

BY CURT CHEREWAYKO

Mike Latschislaw

Inside the Ewan remote telescope (l-r): Harsha Kumar, Heather Matheson, Gilles Ferrand, Jennifer West, Samar Safi-Harb, Paul Edmon, Erica Franzmann, Adam Rogers.

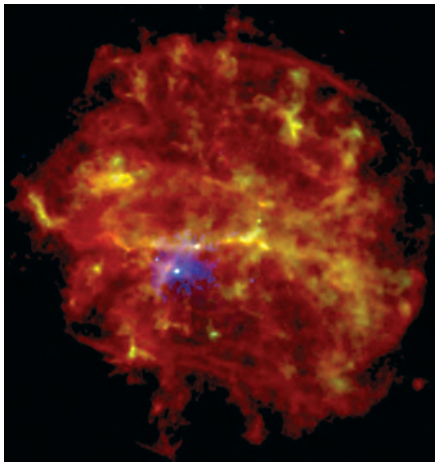
Samar Safi-Harb has to make one particular compromise for her fascination with the remote and exotic: she will never be able to get up close and personal with her research subjects. The associate professor in the Department of Physics and Astronomy (University of Manitoba) will only ever be able to study her subjects remotely via satellites. They are supernova remnants, neutron stars and cosmic rays —parts of the universe that are governed by the most extreme laws of physics. And Safi-Harb continues to explore further into the unknown corners of the cosmos.

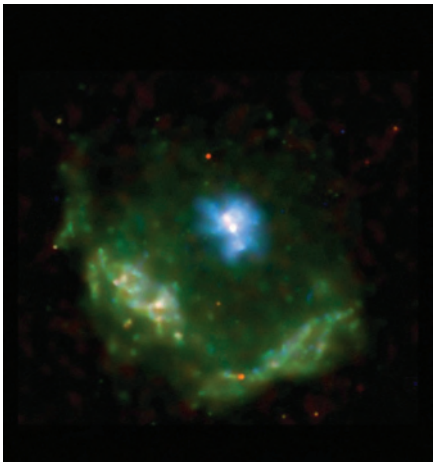
Last August, she was named a researcher for the ASTRO-H x-ray satellite being developed by the Japan Aerospace Exploration Agency (JAXA) and slated for launch in 2014. There are only a handful of x-ray satellites in orbit right now, and ASTRO-H is the first x-ray mission in which the Canadian Space Agency (CSA) has an integral role with prime observation time on the telescope.

JAXA approached the CSA to build an instrument that can measure distortions and wobbles in the satellite's six-metre mast and consequently enhance the performance of the hard x-ray telescope and the accuracy of high-energy data collected from space. For equipping the satellite with the multimillion dollar instrument—built by an Ottawa engineering firm (Neptec)—the CSA receives prime observation time in the first phase of the mission.

"It's a very important mission," said Denis Laurin, a senior program scientist at the CSA. "It's one in which we are contributing a small instrument, but getting a lot out of."

Safi-Harb and two other Canadian researchers were selected as the Canadian science working group members on the Astro-H team through a competitive application process at the CSA. Researchers from Japan, USA, and Europe also receive prime observation time on the satellite for their respective country's contributions to the project. As well, following the initial phase of the





(l-r) X-ray images of two young supernova remnants taken with NASA's Chandra satellite. Source: (left image) NASA/CXC/UofM/M. Gonzalez and S. Safi-Harb; (right image) NASA/CXC/UofM/H. Kumar and S. Safi-Harb.

mission (approximately nine months), the wider scientific community will be able to compete for access to the satellite's unique set of eyes.

For many astrophysicists, submitting proposals to access observation time on space telescopes is a regular task. Much of Safi-Harb's recent research, and of the students she supervises, involves data collected from two existing x-ray satellites operated by National Aeronautics and Space Administration (NASA) and the European Space Agency (ESA).

The ASTRO-H satellite, however, is equipped with newer technology that can collect cosmic x-ray data on a broad part of the electromagnetic spectrum, including imaging data in extreme parts of the x-ray spectrum that have remained undetectable by the existing missions.

"[It will] help us understand the physics of the extreme—extreme temperatures, extreme gravity and extreme magnetic fields," said Safi-Harb, who holds the Canada Research Chair in Supernova Astrophysics. "Studying high-energy phenomena with this new mission will equip us with a unique lab to experiment in and use to understand physics that we could never probe here on earth."

It's also significant that Canadian scientists will be among the first researchers to access celestial data from ASTRO-H.

"This will be when key discoveries are made," said Safi-Harb with an infectious excitement that her students and post-doctoral fellows are familiar with.

Born in Lebanon, Safi-Harb first became interested in high-energy physics at the American University of Beirut (AUB) during a course about the fundamental, elementary particles that make up our world.

"Of course this was all on an extremely small scale, and now I find myself studying things on extremely large scales," she says, adding "instead of studying high-energy physics, I am now studying high-energy astrophysics".

After completing her undergraduate degree in physics at AUB, she arrived in the U.S. to continue her studies at the University of Wisconsin (UW) on a fellowship from the Lebanese-based Hariri Foundation that sponsored qualified Lebanese students. It was there that she first applied her physics knowledge to astronomy research.

A physics professor of hers researching neutron stars invited students to work with him during the out-of-school summer months, and Safi-Harb approached him about her fascination with pulsars and the unique way in which such neutron stars emit pulsating x-ray light. She was particularly fascinated by those objects that energize their surroundings and interact with the remnants of the supernova explosions that created them.

"He gave me x-ray data on a pulsar and went to Turkey for the summer," she said "having sensed my excitement about the subject and being up for the challenge". "I started working on that data having no clue—it was my very first exposure to an astronomy project. I have been hooked ever since."

Safi-Harb's chief inspiration among her peers, both past and present, is Jocelyn Bell Burnell who, as a young astrophysicist, discovered radio pulsars—only to see her supervisor famously receive the Nobel for her discovery. Interestingly, Safi-Harb's current four PhD students are women. Safi-Harb has pondered whether that is significant or not, but can't really explain it. She noted that the ratio between men and women in sciences is lopsided, but less so these days particularly in astrophysics.

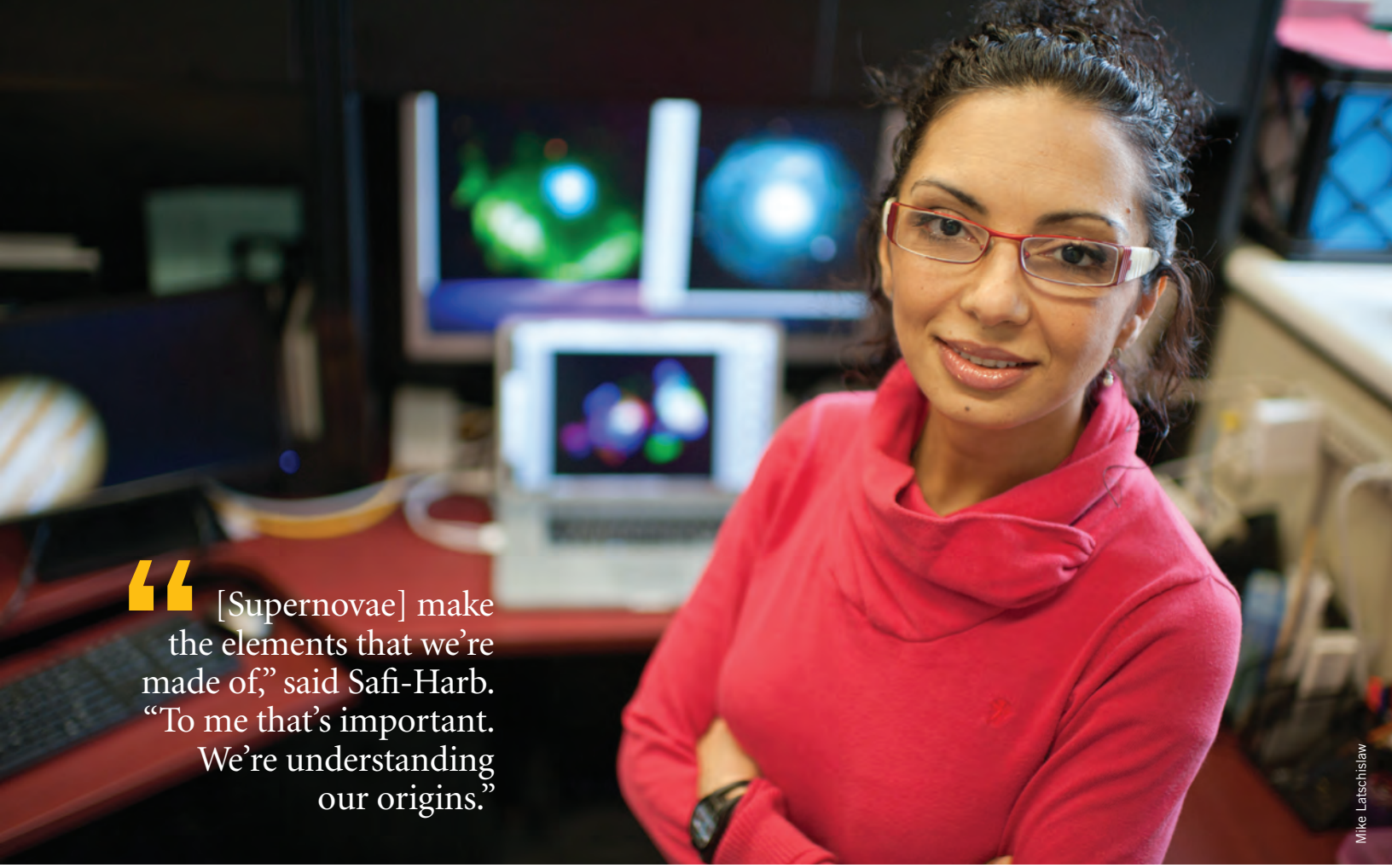
"I like to inspire [my students] with the fact that the discoverer of pulsars was a woman," said Safi-Harb.

After Safi-Harb completed her Masters and PhD in physics at UW, she received another fellowship from the U.S. National Academy of Sciences/National Research Council, this time to conduct research at NASA's Goddard Space Flight Center in Maryland.

By then, Safi-Harb was fully immersed in high-energy astrophysics research, with a particular focus, which continues to this day, on the fate of massive stars that are at the end of their life span. Consider the sun for a moment: it's a smaller star roughly halfway through its life span. The nuclear fusion of hydrogen that occurs in the sun creates the immense heat and light we are familiar with. The exotic stars that Safi-Harb studies result from the death of more massive stars that have exhausted their nuclear fuel. All of the hydrogen in their cores has fused to become helium, but due to their extremely hot core temperatures, nuclear fusion continues to burn helium in the interior to make carbon.

This ageing process continues, creating increasingly heavy elements, like oxygen, neon, magnesium, and silicon, until iron is formed. At this point, iron's stability puts a halt to fusion. Then, fusion's opposing force on a star—gravity—gets the upper hand, causing the star's collapse. As the star collapses, a massive explosion—a supernova—occurs. The explosion sends remnants of the star, including heavy elements that are necessary for life to occur, hurling into space.

"[Supernovae] make the elements that we're made of," said Safi-Harb. "To me that's important. We're understanding our origins."



The heat generated by a supernova is immense. Our sun’s surface temperature is in the thousands of degrees Kelvin range, while the temperature of a young stellar remnant is in the millions of degrees Kelvin. The hottest and most energized supernova remnants will be detectable by x-ray satellites such as ASTRO-H. What’s left of a massive star after it explodes is an x-ray emitting, immensely magnetic and dense sphere made of neutrons—a neutron star—about the size of a small city. The gravitational pull of a neutron star is not as strong as a black hole’s, but it’s nonetheless only comprehensible in terms of relativity. If you were to drop a penny on the surface of a neutron star it would accelerate to half the speed of light before hitting the surface.

Safi-Harb arrived at the University of Manitoba from NASA in 2000 on a university faculty award fellowship from the Natural Sciences and Engineering Research Council of Canada, becoming an associate professor four years later. Today, Safi-Harb lives in Winnipeg with her husband and two young children. Safi-Harb first met her husband at the university in Beirut. They lost touch only to reconnect some years later in North America, initially as colleagues.

Safi-Harb currently supervises four PhD candidates including Harsha Kumar who, like Safi-Harb’s other students be they past or present, notes the enthusiasm in which Safi-Harb approaches her teaching and research.

“Whenever I have a meeting with her, she speaks with so much excitement about the research that it gets me really motivated,” said Kumar, who is currently assisting Safi-Harb with preparatory research for ASTRO-H. “She gives me enough freedom to do my research. Some supervisors constantly keep watch on their students.”

Marjorie Gonzalez, who received her undergraduate and masters degrees in physics and astronomy under Safi-Harb, echoed Kumar’s assessment of Safi-Harb, noting that she is approachable and receptive but expects a fair level of independence.

“She will help you understand something and then let you go to try things out on your own,” said Gonzalez, who is a brain researcher at the University of British Columbia’s Positron Emission Tomography Group.

Gonzalez’ career trajectory is an exemplary defence against the argument that astrophysics, despite the research funding it receives, cannot be applied for any earthly benefit.

She draws a direct connection between her astrophysics education under Safi-Harb and the research she conducts now, which involves x-ray medical imaging of the brains of Parkinson’s sufferers. “It’s just that these images happen to be of people’s brains instead of stars in the sky,” said Gonzalez.

Safi-Harb expects her own research to increasingly focus on cosmic rays, which are mysterious energized particles found in many areas of the universe. One of the mysteries about cosmic rays is the source of their intense energy. Safi-Harb is researching with her postdoctoral fellow, Gilles Ferrand, their origin and the energy they can achieve as they veer into the path of high-speed, energized remnants of supernovae.

In its 2010 to 2020 vision, the Canadian Astronomical Society says high-energy astrophysics research is experiencing “explosive” growth in Canada.

“There are a lot of unanswered questions in this field that I’d really like to pursue,” said Safi-Harb. “We are lucky to have access to these powerful telescopes.”

To learn more about Safi-Harb’s research go to www.physics.umanitoba.ca/snr/

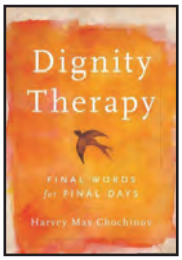
HOT OFF THE PRESSES

Recent books by U of M faculty members

DIGNITY THERAPY: FINAL WORDS FOR FINAL DAYS

(Oxford University Press, 2011)
Harvey Max Chochinov • psychiatry

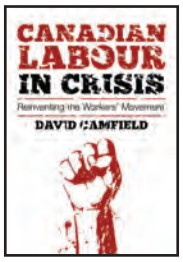
MAINTAINING DIGNITY FOR patients approaching death is a core principle of palliative care. Translating that principle into methods of guiding care at the end of life, however, can be a complicated and daunting task. Dignity therapy, a psychological intervention developed by Dr. Harvey Max Chochinov and his internationally lauded research group, has been designed specifically to address many of the psychological, existential, and spiritual challenges that patients and their families face as they grapple with the reality of life drawing to a close. Tested with patients with advanced illnesses in Canada, the United States, Australia, China, Japan, Scotland, England, and Denmark, and Portugal, dignity therapy has been shown to not only benefit patients, but their families as well.



CANADIAN LABOUR IN CRISIS: REINVENTING THE WORKERS' MOVEMENT

(Fernwood Publishing, 2011)
David Camfield • labour studies

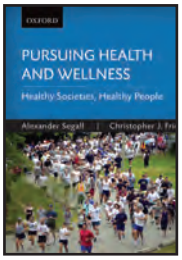
DOES CANADA HAVE a working-class movement? Though many of us think of ourselves as middle class, most of us are, in fact, working class: we work for a wage. And though many of us are members of unions—the most significant organizations of the working-class movement in Canada—most people do not understand themselves to be part of this movement. Canadian Labour in Crisis asks why this is so. Through an analysis of the contemporary Canadian working-class movement and its historical development, David Camfield offers an explanation for its current state and argues that reform within the movement is not enough. From the structure of organizations to their activities and even the guiding ideology, Camfield contends that the movement needs a radical reinvention—and offers us a new way forward in reaching this goal.



PURSUING HEALTH AND WELLNESS: HEALTHY SOCIETIES, HEALTHY PEOPLE

(Oxford University Press, 2011)
Alexander Segall • sociology and community health sciences, and Christopher J. Fries • sociology

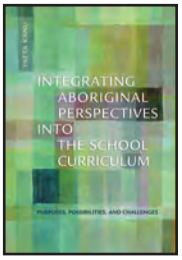
AIMING TO UNRAVEL THE MYSTERIES of our health-care system, Alexander Segall and Christopher Fries look beyond health as mere absence of disease to explore the structural and behavioural factors that affect it. Viewing health as a social construct, the authors look at how inequalities in social class, gender, and ethnicity produce broad disparities in population health before narrowing their focus to analyze the personal determinants of wellness. They conclude with a look at the parts that make up our health-care system, pondering how complementary and alternative care may be incorporated while inviting the reader to consider the personal, professional, and public responsibilities that must be met to achieve healthy futures for Canadians.



INTEGRATING ABORIGINAL PERSPECTIVES INTO THE SCHOOL CURRICULUM: PURPOSES, POSSIBILITIES, AND CHALLENGES

(University of Toronto Press, 2011)
Yatta Kanu • education

FROM IMPROVED CRITICAL THINKING to increased self-esteem and school retention, teachers and students have noted many benefits to bringing Aboriginal viewpoints into public school classrooms. In Integrating Aboriginal Perspectives Into the School Curriculum, Yatta Kanu provides the first comprehensive study of how these frameworks can be effectively implemented to maximize Indigenous students' engagement, learning, and academic achievement.



Based on six years of empirical research, Kanu offers insights from youths, instructors, and school administrators, highlighting specific elements that make a difference in achieving positive

educational outcomes. Drawing on a wide range of disciplines, from cognitive psychology to civics, her findings are widely applicable across both pedagogical subjects and diverse cultural groups.

Kanu combines theoretical analysis and practical recommendations to emphasize the need for fresh thinking and creative experimentation in developing curricula and policy. Amidst global calls to increase school success for Indigenous students, this work is a timely and valuable addition to the literature on Aboriginal education.

RECESSES OF THE MIND: AESTHETICS IN THE WORK OF GUÐBERGUR BERGSSON

(McGill-Queen's University Press, 2012)
Birna Bjarnadóttir • Icelandic language and literature

RECESSES OF THE MIND **EXPLORES** Guðbergur Bergsson's aesthetics of life and literature. Bergsson—like so many writers whose language is not widely spoken or read—is scarcely known outside his homeland, but the psychological depth of his vision reveals the minds of his characters in ways that are reminiscent of novelists such as Hamsun, Faulkner, and Garcia Márquez.

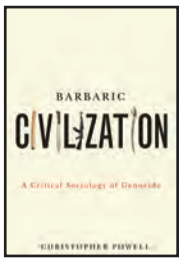
Birna Bjarnadóttir constructs a deep and comprehensive argument for Bergsson's significance as a master of narrative. Crossing centuries, oceans, and continents, her contextualization of Bergsson's aesthetics stretches from his native land's literary tradition to the cultural domains of Europe and North and South America. Her investigation of his ideas on beauty, love, and belief, presented as a dialogue between Bergsson and numerous other writers and philosophers—Plotinus, Augustine, Nietzsche, Kierkegaard, Blanchot—is a striking reflection on some of the most important questions of modern times.

Recesses of the Mind introduces a profound writer to the international stage. The book's exploration of the cultural periphery is equally significant, suggesting new interpretative strategies for considering cultural contributions from isolated places.

BARBARIC CIVILIZATION: A CRITICAL SOCIOLOGY OF GENOCIDE

(McGill-Queen's University Press, 2011)
Christopher Powell • sociology

WHY HAVE THE LARGEST MASS murders in human history taken place in the past hundred years? Why have European colonizers so often denied the humanity of the colonized? In Barbaric Civilization, Christopher Powell advances a radical thesis to answer these questions: that civilization produces genocides.



From its beginnings in the early twelfth century, the Western civilizing process has involved two interconnected transformations: the monopolization of military force by sovereign states and the cultivation in individuals of habits and dispositions of the kind that we call "civilized." The combined forward movement of these processes channels violent struggles for social dominance into symbolic performances. But even as the civilizing process frees many subjects from the threat of direct physical force, violence accumulates behind the scenes and at the margins of the social order, kept there by a deeply habituated performance of dominance and subordination called deferentiation. When deferentiation fails, difference becomes dangerous and genocide becomes possible.

Connecting historical developments with everyday life occurrences, and discussing examples ranging from thirteenth-century Languedoc to 1994 Rwanda, Powell offers an original framework for analyzing, comparing, and discussing genocides as variable outcomes of a common underlying social system, raising unsettling questions about the contradictions of Western civilization and the possibility of a world without genocide.

INTIMATE PARTNER VIOLENCE IN LGBTQ LIVES

(Routledge, 2011) Edited by Janice Ristock • women's and gender studies

QUEER LIVES REMAIN at the margins of most academic inquiry into domestic violence. When same-sex violence is considered, it is most commonly as an "added on," without close attention to the specificity and meaning of violence within the lives of lesbian/ gay/ bisexual/ transgender/Two-Spirit and queer people (LGBTQ). This edited volume seeks to change this discourse by bringing together the most innovative research about intimate partner violence that is specific to the lives of LGBTQ people. Including contributions based on research conducted in the United States, the United Kingdom, Canada and Australia, the volume is framed around central themes: conceptualizing violence; exploring differing spaces and lived experiences of violence; and the ethical challenges of responding to violence. The contributors also consider issues of race, class, gender, sexuality and other social differences, moving beyond a simple gender lens to one involving a framework of intersectionality.

Entrepreneurial Spirit

BY MELNI GHATTORA

AS NOBEL PRIZE WINNER ALBERT EINSTEIN once said, "To raise new questions, new possibilities, to regard old problems from a new angle, requires creative imagination and marks real advance in science."

An awards program administered by the Natural Sciences and Engineering Research Council of Canada (NSERC) encourages natural sciences or engineering graduate students to do exactly that, to push the limits and think outside of the box.

Established in 2004, the Innovation Challenge Awards have recognized and rewarded Canada's brightest young minds and just this past October two University of Manitoba graduate students received honourable mention prizes.

Azadeh Yodallahi (electrical and computer engineering) and Fernando Luciano (food science and human nutritional sciences) each earned themselves $1,200 for demonstrating an entrepreneurial spirit by identifying ways in which their research thesis results can be developed into products and processes to benefit Canadians.

"I am so honoured to receive this recognition from the NSERC Innovation Challenge Award program. This research was the result of a multidisciplinary collaboration between different researchers in the engineering and medicine departments," says Yodallahi. "The award acknowledges the innovative nature and importance of our research for home diagnosis of obstructive sleep apnea."

Obstructive sleep apnea (OSA) is a common disorder which affects approximately 8 per cent of our population. While full night polysomnography (PSG) is the gold standard for sleep apnea diagnosis, due to its high cost and time consuming nature more than 90 per cent of OSA patients are undiagnosed. These complications have persuaded researchers to look for portable sleep apnea monitoring devices.

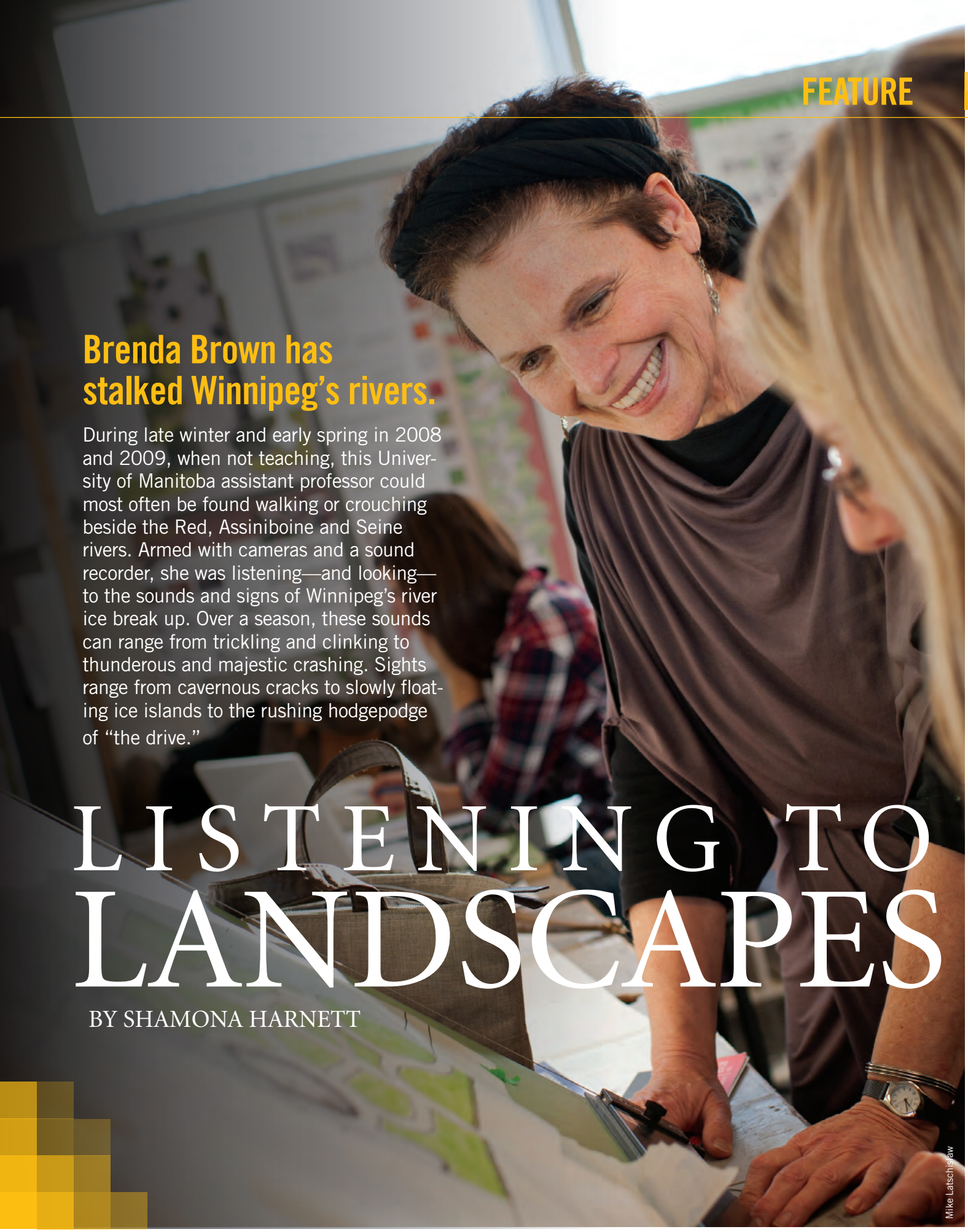
Respiratory sounds analysis is a simple and non-invasive way to study the pathology of the respiratory system. "The major contribution of my PhD was to develop a novel method for acoustical airflow estimation from tracheal sounds with greater than 90 per cent accuracy" explains Yodallahi. "We combined the use of the acoustical airflow estimation with pulse oximetry to implement a portable device for acoustical sleep apnea diagnosis (ASAD)."

The budding researcher validated the ASAD system by performing simultaneous full-night recordings with PSG and the ASAD device in 67 patients referred to the sleep laboratory. This research has been particularly satisfying because it has made a practical contribution to improve healthcare technology which is one of the ultimate aims of biomedical research and has earned three patents (one approved, two pending).

Luciano has developed an odourless mustard meal with strong antimicrobial activity that can be used to eliminate *E. coli* O157:H7 (a deadline bacterium responsible for foodborne illness outbreaks around the world) from dry sausage causing low impact on sensorial characteristics. This is a win-win situation where a by-product of mustard oil extraction can be exploited as a natural food preservative.

"The NSERC Innovation Challenge Award was a great recognition of our hard work, and it brings me a new breath of enthusiasm to keep on doing practical research that can directly benefit our society," says Luciano.

NSERC and the Business Development Bank of Canada provide the major funding for the Innovation Challenge Awards. Financial contributions received from MDS Analytical Technologies, Research In Motion, Syncrude, the Dairy Farmers of Canada and 3M are used to provide honourable mention recipients with cash prizes. ■



Brenda Brown has stalked Winnipeg's rivers.

During late winter and early spring in 2008 and 2009, when not teaching, this University of Manitoba assistant professor could most often be found walking or crouching beside the Red, Assiniboine and Seine rivers. Armed with cameras and a sound recorder, she was listening—and looking—to the sounds and signs of Winnipeg's river ice break up. Over a season, these sounds can range from trickling and clinking to thunderous and majestic crashing. Sights range from cavernous cracks to slowly floating ice islands to the rushing hodgepodge of "the drive."

LISTENING TO LANDSCAPES

BY SHAMONA HARNETT

Mike Latschislaw

> “Eco-revelatory design refers to landscape design intended to reveal and interpret landscape ecosystem phenomena, processes, and relationships.”

It seemed to Brown, who moved to Winnipeg from Florida five years ago, that this particular natural phenomenon was one many Winnipeggers had not heard or even seen (or at least, not paid attention to).

“I had seen and heard parts of the ice breakup in my first couple years here. So I figured there would be some pretty fantastic sounds,” says Brown, curled up on the living room sofa in her quiet St. Boniface home.

Brown, who teaches landscape architecture and environmental design, has, she says “cultivated a habit of listening.”

Her perspective is unique. She has terminal degrees in sculpture as well as in landscape architecture. She has also worked as an editor and writer on landscapes and landscape architecture. This experience allows her to take on a wide variety of creative projects—all concerned with landscapes.

Her studies of Winnipeg rivers resulted in Spring Ice, a 2010 exhibit of site specific installations planned to coincide with that year’s ice breakup. With the help of student assistants, especially Yoshihiro Yabe, Brown engineered three video projections on the stairway of the university’s newest engineering building, one on each of the foyer floors of architecture’s Russell Building, and two at the entrance of what was then Winnipeg’s Plug In Gallery. She made several different videos ranging in length, from less than five to almost 30 minutes, and at each site, tried to change them every day or two. Each video was constructed from her photographs and sound recordings. Each documented a different aspect of the breakup.

Some of Brown’s ice sounds resemble thunder, some a windstorm, while others sound like a waterfall or the clinking of thousands of tiny crystals.

“I had originally thought that the Spring Ice installations would just be sounds, but then I became concerned that people wouldn’t get it. So I decided to work with the photographs too. And of course the ice is often very beautiful visually—and the ice forms are amazing.”

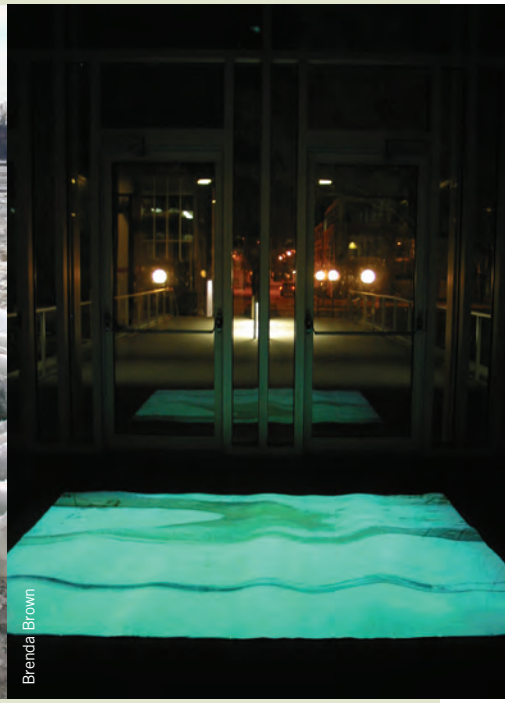
The end result?

Reactions varied, but she was basically thrilled with it all, says Brown. During the day in the Russell building, the images were barely visible. “But at night they showed up and were magical. And that difference and the transitions between the visible and the invisible were intriguing,” she remembers. “Students told me how they especially liked it when they were working in Russell late at night and would hear the sounds up in their studios and then they would pass through the sounds and glowing images on their way home…In engineering, one researcher told me that she could hear the sounds in her lab and it was such a wonderful thing to have these sounds of nature there.”

Spring Ice also included a premiere performance in Eva Clare Hall of two new musical works. Brown collaborated with composer Michael Matthews of the U of M’s Marcel A. Desautels Faculty of Music on *Winter is When Snakes,* a setting of a poem by University of Manitoba poet, Dennis Cooley. She also worked for a second time with composer Richard Festinger, of San Francisco State University, this time on a series of songs also called *Spring Ice.*

Mike Latschislaw


Brenda Brown and Suzy Melo


Brenda Brown

(left) Brenda Brown recording on the Red River

(right) Spring Ice at the Russell Building, its sounds always audible but its shifting images only apparent at night

One of Brown's goals as a landscape designer and artist is to prod people to hear the sounds around them and pay more attention to their environment.

"There have been studies that show sounds can indicate the health and diversity of an ecosystem," says Brown. "[Sounds are] a neglected aspect of our design of the environment."

Her work with sound, which began in 2003, is part of a long term investigation on what Brown calls eco-revelatory design.

"Eco-revelatory design refers to landscape design intended to reveal and interpret landscape ecosystem phenomena, processes, and relationships." In fact Brown coined the term when she and two professors at the University of Illinois organized a national exhibit of landscape architecture projects. It was accompanied by a catalogue doubling as a special issue of Landscape Journal, the North American academic journal for landscape architecture.

"Besides wanting to promote eco-revelatory design," she recalls, "we wanted to bring theory and practice together." Brown was editor and designer of the catalogue. The exhibit opened at the University of Illinois in 1998 and closed at the Washington DC's National Building Museum in 2000.

Brown identifies three areas of investigation on landscapes as/of sound: listening gardens, sound, or listening trails, and sound designs. She is particularly interested in what she calls "the reciprocal revelations of landscapes and sounds, how sounds can reveal landscapes and how landscapes can reveal sounds." She is therefore also concerned with how people perceive, understand and engage with landscapes.

On Crowley Listening Trail in Myakka, Florida, visitors followed a path through five distinctive sonic environments. "Sounds are different in these different areas because the landscape is different," Brown observes. "Soils are different, moisture is different, so plants are different, light is different. This means there are different habitats and different animals, which means different sounds." Each of the five areas was identified by one animal inhabiting it, for instance a raccoon, a bobcat, or otter. Images of these animals were displayed on that area's trail posts, and that area's listening devices took the form of that animal's ears.

Those handmade "ears" now cover a large table and shelves in Brown's basement. Sometimes up to a meter tall, they are the listening devices' sound receptors; flexible tubing carries the sounds from the receptor to listeners, sometimes as much as 60 feet. Along the trail, most were placed high in trees to catch sounds of the canopy.

In Brown's living room other sound receptors lean against the wall. Two, made from bamboo, canvas and bent wood were used on her first two trails, a pilot project at the MacDowell Colony. Two others, shaped like flowers, were part of exhibit installations at Ringling College of Art and its Selby Gallery.

"There were two intertwined listening gardens—one inside, one outside," she says. Outside, listening devices were installed in trees on a street median, in a dormitory complex, beside the bayou

Bayou listening device from Ringling Listening Garden. The ear piece (left), connected to the water lily and its pad, allowed visitors to hear sounds within the bayou waters.

and within the bayou. The devices' sound receptors were based on shapes of local native flowers.

Inside Selby Gallery, a sound mixer with headphones was installed within a special gazebo built by Brown. At the same time the year before, she had recorded at six different times, at each of the "stations" where her floral listening devices were later installed. "The sounds were tied to one another in terms of time. One would hear the sounds of a weekday noon from one station at the same time as the sounds of weekday noon from another station. But it was up to the visitor to mix these different sounds," Brown explains. The sounds reflected the campus' urban environment. Ambient sounds of traffic, leaf blowers, and lawn mowers were mixed with sounds of skateboarders, slamming doors, human voices, and mysterious sounds from the bayou waters.

Brown is currently working on a project at TzinTzunTzan, a national archeological site overlooking the east shore of Lake Pátzcuaro, 230 miles west of Mexico City. She conceived the idea when she was artist in residence at the Centro Mexicano para la Música y las Artes Sonoras (CMMAS) in 2010.

"I had been traveling around Michoacan, looking and listening to different landscapes. It was near the end of my residency; an earlier project idea wasn't gelling.Then I went to TzinTzunTzan. TzinTzunTzan is an onomatopoetic Purépecha word meaning place of the hummingbirds. It was the ceremonial capital of the Purépecha till the Spanish arrived in the sixteenth century. Guidebooks tell you this, and sometimes remark that today few if any hummingbirds are left. It is a beautiful site. I went there and knew I wanted to recreate hummingbird habitat there. It would be a sound design, a landscape design driven by the sounds of hummingbirds."

She has teamed up with Roberto Lindig-Cisneros, a restoration ecologist at the National Autonomous University of Mexico-Morelia. By planting appropriate species of native plants, they hope to attract up to 18 different hummingbird species. "It's not definite yet," she says cautiously, "but we met with officials of INAH (Mexico's agency for archaeology and history) back in September and they seemed to like the idea a lot. We are now waiting for official approval."

In any case, Brown will be spending part of her upcoming sabbatical in Mexico, continuing research on area native plants and hummingbird images in Mexican art and crafts, as well as developing designs for TzinTzunTzan and a related exhibit.

Brown recalls growing up in Maryland surrounded by tobacco fields and wooded areas, "but only ten miles from the White House." As a teen, she often took a 45-minute bus trip into Washington to visit the wealth of museums there. And so the contrast between urban and rural landscapes struck her early. "I developed some sense of the range in what a landscape can be," she says.

The yellow-peach walls in her living room cast a flattering glow onto Brown's face and warm up her cool, bare-walled room. Books on ecology, landscape architecture, birds, Mexico and music line the room's hardwood floor. Outside the large window, across her snowy yard and the street is the Seine River, in winter a favourite place for her walks, in summer for her kayaking. "It is familiar to me now," she smiles, "and there is almost always something new to see—and hear—there."

Viewpoint

What's the beef with Paraguay?

BY MARÍA JOSÉ PATIÑO VALIENTE

Mike Latschislaw

What is one of the most exciting activities during the summer in Canada? Barbeque! Well … in South-America, we love barbeque too. We cook beef meat instead of hamburgers and hotdogs though. In particular, Paraguay has one of the most delicious beef meats for barbeque in the world. I am not saying this just because I am from Paraguay. Jude Webber, a journalist from the Financial Times, **stated this in his article in early 2011.**

The beef industry is one of the most important economic activities in Paraguay. In 2010, livestock represented 24 per cent of the Paraguayan Agricultural Gross Domestic Product. The level of beef production in Paraguay has historically been sufficient only to serve the local market. In the early 2000s the level of exports started rising at a remarkable rate. Beef exports experienced a growth rate of 155 per cent from 2004 to 2010 according to the Central Bank of Paraguay. At present, Paraguay supplies 4 per cent of beef to the world. The rise in the level of exports was mainly due to improvements in sanitary conditions and cattle genetics, and better practices in animal feeding and management. Also, in 2001 the European Union accepted Paraguay into the Hilton quota, which served as a new international window for other markets. New markets provided Paraguay the opportunity to reach an unusual level of beef exports in 2004 and gave room for continued growth.

Economic analyses aimed to assist livestock producers and beef industry participants are limited in Paraguay. Very little research has been performed in Paraguay in this area. This motivated me to extend my studies and conduct research in livestock economics. As a graduate student in the department of agribusiness and agricultural economics at the University of Manitoba, I am currently working on my thesis on producers' and consumers' welfare changes after the 2004 boom of beef exports in Paraguay. In my research, I estimate demand and supply equations of the various meat products in Paraguay, and examine the implications of the market changes observed in 2004. The results are expected to help livestock and beef market participants make production and marketing decisions and to provide policy makers with more insight about the market. As an example, this model can contribute to assess the consequences of events that affect beef meat exports, as a new outbreak of foot-and-mouth disease.

So, remember, if you go to South America, go to Paraguay and try the traditional barbeque there. You are not going to regret it! ■

SHOWCASING STUDENT RESEARCH

BY MARIIANNE MAYS WIEBE

Out of Africa, and other adventures in research

Annual poster competition highlights outstanding undergraduate research from nearby vicinities and far-flung places

Sarah Makenbach spent last summer doing research at a nature reserve in Africa, and it felt a lot like home.

"The yellow grasses and flat flood-plain where we were, with handfuls of trees here and there, really seemed a lot like the prairies—and home—to me," she said.

"The climate was a lot like late spring in Manitoba, with days up around 15° C on average, and sometimes frost overnight. Although, because it was winter there, it was very dry and sunny every day."

Makenbach, an honours student in biological sciences, had never been as far away as Africa, but she adjusted soon enough. Last summer she researched her honours project in S.A. Lombard Nature Reserve, near the town of Bloemhof in the northwest province of South Africa.

Her work on the activity and co-operation of African ground squirrels and yellow mongoose became the basis for a winning poster in the university's undergraduate student research competition.

The competition took place on October 27 in the multi-purpose room at University Centre on the Fort Garry campus. More than 55 participants showed posters in four categories: applied sciences, health sciences, natural sciences and social sciences/humanities. This year's investigations ranged from family health needs in a First Nations community to nutrient removal from wastewater.

Makenbach's poster, "For crying out loud: Response of African ground squirrels (*Xerus inauris*) and yellow mongoose (*Cynictis pencillata*) to inter-specific alarm calls," took first place in the natural sciences category.

She discovered African ground squirrels through faculty member Jane Waterman who researches behavioral, ecological and evolutionary relationships within and among species; for over a decade and a half, she has looked

Mike Latschislaw

(left) Sarah Mackenbach, (right) Victor Penner explaining the finer points of his research methodology to a judge at the poster competition.

at the social organization and mating systems in both North American and African ground squirrels.

Makenbach's own research was on the relationship between mammals in different orders: the African ground squirrel, a rodent, and the yellow mongoose, a carnivore. The results of her study showed that the yellow mongoose receives a benefit of enhanced predator detection by grouping with the African ground squirrel.

"Both the poster competition and the co-op program were a great experience," said Makenbach.

"I received so much support from Dr. Waterman throughout the work placement. And I had never done a research poster before, so it was a unique opportunity to present the work and data I had gathered."

Presenter Victor Penner conducted his research a little closer to home. His work on urgent care visits by patients with eye problems was presented in his poster, "Visits to Misericordia Urgent Care Related to Ocular Complaints."

The results of his research pinpointed possible areas for increased efficiency in the referral system for ophthalmological care. In reviewing 3,500 patient charts for those urgent care visitors whose complaints were eye-related, Penner analyzed the data, follow-up and ultimate diagnoses, and found that 93 per cent of those with a specific type of ocular complaint were eventually referred to ophthalmology.

He agreed that the poster competition was a fantastic learning experience. "I was fortunate to have some of my classmates involved; we read and reviewed each other's work and had a great afternoon. I also found the judges to be genuinely interested and they asked great, focused questions."

Penner, a medical student who practiced as an optometrist before coming into the program, won second place in the health sciences category.

All poster competition participants were graded on the scholarly, scientific or creative success of their content, as well as the merit of the visual display, the clarity of their conclusions and objectives and their explanations to the audience.

First and second-place cash prizes of $500 and $250 were awarded to the top two entrants in each category; posters were judged by university faculty members, staff and individuals from topic-related government departments.

Makenbach has indicated that her winnings will be gratefully applied to a cause that's also pretty close to home: her university tuition.

Other winners in this year's competition were Ryan Howard (first place, applied sciences), Kirill Levin (second place, applied sciences), Uliana Kovaltchouk (first place, health sciences), Brandi Shabaga (second place, natural sciences), Lindsay Bacala (first place, social sciences and humanities) and Joanna Bhaskaran (second place, social sciences and humanities). ■

(l-r) Cape African ground squirrel, African sunset, the research lookout

All photos Sarah Makenbach

THE GAME OF LIFE

BY MELNI GHATTORA AND JENNIFER ROBINSON

Mike Latschislaw

We are all playing in the game of *LIFE*. While the board game version simulates a person's travels through his or her life, from college to retirement, careers, marriage, and possible children along the way, the reality TV version doesn't always pan out as scripted.

Growing up in Manitoba, Cynthia recalls a childhood with little to no difficulty accessing dental care. In fact, with the help of social assistance, she was able to get the much needed braces to help straighten her smile. Today she faces a much harsher reality.

The mother of six, with children ranging in age from three to 22 years, says it breaks her heart that she isn't able get her daughter the same care she had growing up.

"It hurts. They call my daughter sniggles and a bunch of other bad words…I feel sorry for my daughter. I've been trying to do this for her since she was a little girl," says Cynthia of her eldest Brittany, 22, who is in dire need of braces.

For Cynthia, the limitations are twofold. She is of lower income status supported through social assistance and has limited access to dental care, geographically speaking. Cynthia and her children live in Winnipeg's inner-city.

This comes as no surprise to Robert Schroth or 'Dr. Bob' as he is affectionately referred to by his staff and colleagues, "We do realize that there are underserviced areas of the province. We might think that everybody in Winnipeg might have access to care and that's not necessarily true either."

The assistant professor of preventive dental science and research scientist at the Manitoba Institute of Child Health (MICH) has never worked a day in private practice. His clinical work has always been in programs targeted to improve access to care, complimented by his research initiatives to prevent early child hood tooth decay.

Pediatric dental surgery costs the province an average of $3,500 per patient, which translates into over $8 million per year. Even more alarming is that more than 2,300 preschool children in Manitoba receive a general anesthetic to undergo major dental surgery. Shockingly, this is the most common day surgery procedure in Canada. And it is almost entirely preventable.

"One area of our research looks at nutritional differences between children going for dental surgery and those without any cavities," says Schroth. "Most kids needing dental surgery come from disadvantaged backgrounds, where finances, education, and access to resources are major barriers to dental care. They are often not provided with proper nutrition either, eating foods high in sugar which largely contributes to tooth decay."

By looking at the nutritional differences between children going for dental surgery and those without any cavities, he is starting to see a trend. In collaboration with Herenia Lawrence at the University of Toronto and the Canadian Institutes of Health Research, Schroth is implementing a program to provide dental care and education to Aboriginal mothers and children throughout Canada, New Zealand, and Australia.

Baby Teeth Talk provides mothers with educational sessions on oral health, access to dental care, fluoride varnish applications for their baby's teeth, and follow-up guidance counseling. He hopes that this will reduce the number children needing dental surgery.

According to Schroth, who holds a three-year term as Clinical Research Professorship in Population Medicine with the Manitoba Medical Service Foundation and the Manitoba Health Research Council (appointed in July 2010), "It's not just about preventing surgery. Oral health is necessary for eating, digestion, speech, smiling, and it can often be a proxy for other important factors such as quality of life and psychological well-being overall."

Lower levels of vitamin D and calcium, as well as low iron and hemoglobin, are seen in pediatric dental surgery patients. So, is it lower Vitamin D and calcium which is causing tooth decay? Or, is tooth decay impacting the child's ability to eat properly and thereby compromising nutrition?

At this point, he is unable to provide definitive answers as to which way the causal arrow points. However, he is more interested in the applications of this research to those in need. "How can we translate this into real life?" he asks of each of his projects.

But what if preventative measures could be tackled earlier on?

Schroth is working on another study looking at the effects of vitamin D in pregnant mothers. With grants from Manitoba Health and the Health Sciences Centre Foundation, he's hoping to show that giving mothers just two high doses of vitamin D supplements throughout pregnancy will significantly improve the health of their babies.

The scientific literature suggests that many women have low vitamin D levels, especially during pregnancy. In fact, through his own thesis work, Schroth found a link between the vitamin D levels in pregnant mothers and their children's oral health at one year of age.

"Given its importance in the formation of bones and teeth, our goal is to boost vitamin D levels during pregnancy in order to help improve children's health," says Schroth. "We're hoping that at some stage high dose vitamin D supplements will be included in the Best Practices Guidelines for pregnant mothers in Manitoba."

Expectant mothers in the experimental group of this study receive 50,000 International Units (IU) of Vitamin D in the second trimester of pregnancy, and then the same dose again in the third trimester for a total of 100,000 IU. To-be mothers in the control group receive prenatal care as usual. "Once their babies are about one year old, they'll come back in for follow up testing which will include measurements of height and weight, and of course, a dental check-up. Mothers will be returning with their one-year olds this January (2012)," he says excitedly.

And it's no accident that this date corresponds perfectly with the recommended age that kids have their teeth checked (at one year old).

Three years ago the exemplary of the 'scientist-practitioner' model, that medical professionals strive towards, started surveying dentists to see how many knew that they were supposed to see children at about one year of age (when the child has roughly eight teeth in the mouth). From this research, Schroth et al. published a paper that reported the results. The majority of dentists were not seeing children until at least age three, by which time serious oral health problems were often underway. Fortunately, the Manitoba Dental Association (MDA) took notice and launched the *Free First Visit* program to promote early childhood oral health.

Funded by MICH, Schroth and his team of collaborators from the *Healthy Smile Happy Child* partnership are currently investigating how well this project is working. They are surveying dentists throughout the province to see how many children under age three are being seen. They are also trying to determine whether dentists are starting to become more familiar with early childhood oral health issues. Dentists are completing tracking forms for children that they see as part of the *Free First Visit* program. This will provide useful information on where these kids are coming from and who is seeing them. "Our plan is to share these results with the MDA to provide them with what they need so that they can know the impact the program has had".

As for the number of dental surgeries performed in Manitoba, Schroth is looking to reduce the province's average through the *Happy Smile Healthy Child* program.

This partnership was first assembled by Jeanette Edwards of the Winnipeg Regional Health Authority (WRHA) as a result of the long waitlist for dental sur-

(l-r): Shauna McGregor (*Baby Teeth Talk* study), Robert Schroth, Janis Gojda (*Healthy Smile Happy Child* project), Eleonore Kliewer (*Healthy Smile Happy Child* project & research coordinator).

Mike Latschislaw

> “Given its importance in the formation of bones and teeth, our goal was to boost vitamin D levels during pregnancy in order to help improve children’s health,”

gery. In partnership with the Burntwood Regional Health Authority, several professors from the University of Manitoba (including those from not only Dentistry but from Pediatrics as well), the Manitoba Dental Association, Health Canada, and others, Schroth is helping to promote and raise awareness of the importance of early childhood dental visits and oral care.

“The other interesting thing we’re doing is we’re starting to map out the dental surgeries, in partnership with WRHA Evaluation and Research Unit, so we can start looking at things like ‘Where do these kids come from?’ ‘Where are the “hot spots” so to speak, within the province and in Winnipeg?” he explains. “Using postal code mapping [that it can indicate the community areas or neighborhoods where there are higher needs] and realizing that if we have limited health promotion dollars to spend, maybe that’s where the emphasis needs to be targeted, on the higher risk communities.”

Though not exactly ‘lucrative,’ (Schroth laughs), his decision to stay in Manitoba and work with at-risk clients leaves him thoroughly satisfied. His work is important and will continue to impact health promotion and well-being for those who greatly need it, but planting roots in the golden prairies also benefits those embarking on the academic path to higher education.

Shelley Halchuk, an undergraduate student who is in her second year in the Faculty of Dentistry, met her supervisor after he approached the University of Manitoba’s ACCESS program. He was looking for a First Nations undergrad student who might be interested in doing research and through that initiative the two connected.

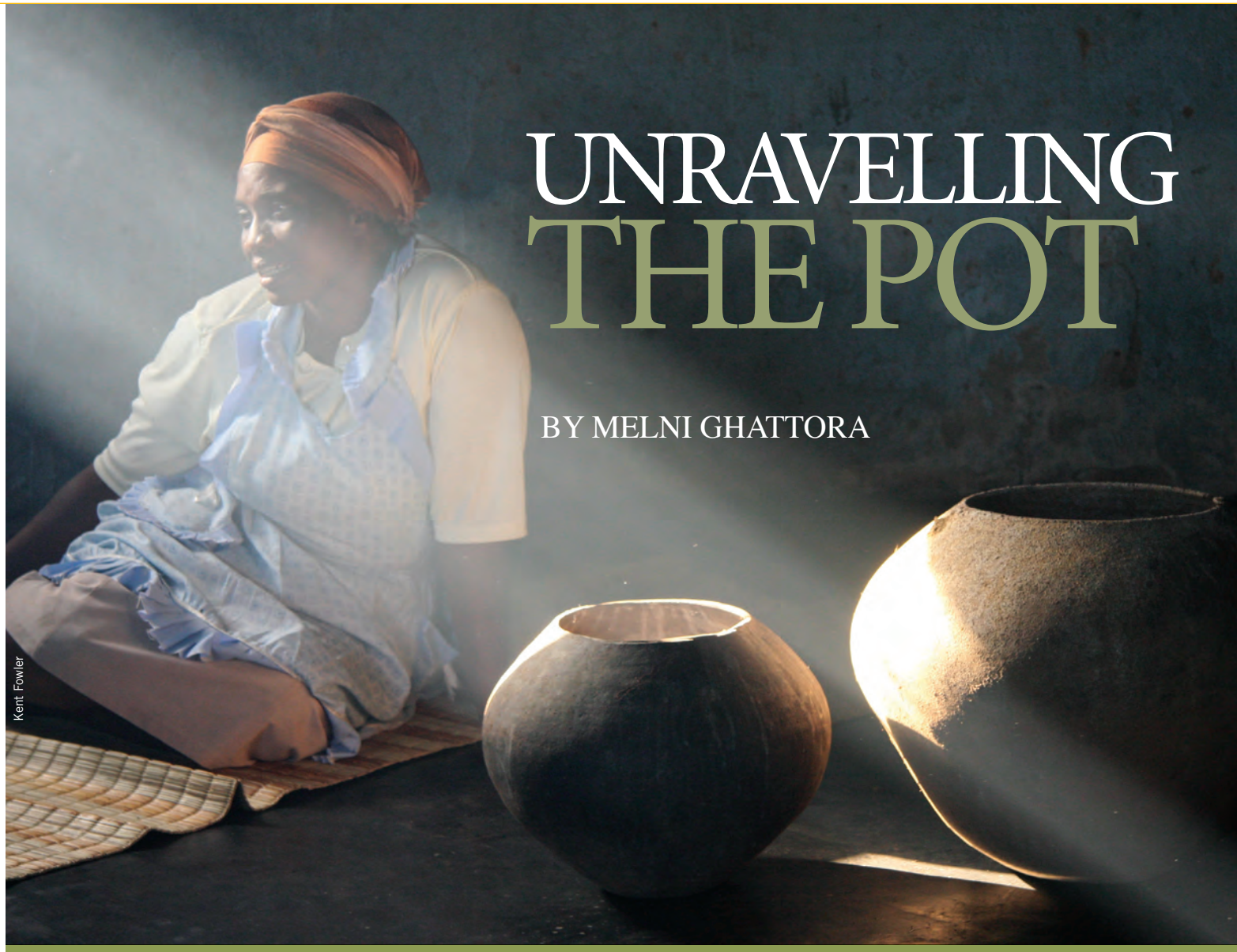
“I really feel he’s shaped a lot of my goals, I think I had different ideas before I met Dr. Schroth,” says Halchuk. “He’s been an absolutely fabulous mentor, not to mention he’s an outstanding person who has great morals. It’s so easy for many dentists to go the route of private practice to make an income. To stay behind and be an academic and forfeit those financial opportunities, I highly respect that.”

Schroth performs an infant dental exam in the community as part of an oral health outreach event.

She adds that working with immigrants and high-risk populations is not something she feels many dentists would do as their main area of clinical practice, “It’s public health dentistry. It’s definitely not the tuxedo practice.”

It was his realization of the limited number of Aboriginal oral health professionals in Manitoba that prompted Schroth.

“Solutions often come from within the community and I think that’s just a wonderful way to mentor and help Aboriginal students that have an interest in oral health. It’s challenging but we definitely need more Aboriginal dentists and hygienists out there,” says Schroth. “We’re looking at work that’s involved with Aboriginal populations and I think it’s nice to make sure there is opportunity for Aboriginal students to be involved in helping communities with care and prevention and but also helping advocate for them as well for improvements to the system or the delivery models. I think that’s really important too.”



Kent Fowler

UNRAVELLING THE POT

BY MELNI GHATTORA

WHILE WALKING THROUGH A GIFT SHOP in Banff, Alberta, a set of dusty pots tucked away in the corner of a highsitting shelf catch Kent Fowler's eye. It's an experience he describes as one that "blew my mind." "What is this stuff doing here? How did it get here?" He remembers thinking to himself.

As he suspected, Fowler, an assistant professor of anthropology, had stumbled across ceramic pots that originate from Southern Africa, an area he is very familiar with.

He has been conducting archaeological research in South Africa since 1997, and is a specialist who studies pottery. His office shelves are lined with remarkable artifacts he has collected over the years, and when he begins the story of how these vessels took form, only then does one truly appreciate the history each pot reveals.

In December 2010, Fowler and his team wrapped up a three-year study called The Nguni Ceramics and Society Project (NCSP). The group worked in Swaziland and throughout eastern South Africa, from the Mozambique border, down to the Eastern Cape. Covering approximately 25, 000 square kilometres, they worked with Swazi and Zulu potters (two branches of Nguni speaking peoples in Africa today), to observe and document the process of how ceramic pots are made within each group, and determine how long the process dates back.

"One problem particular to southern Africa is that there's one thousand years of Nguni prehistory where most of the durable artifacts, things that survived in the archaeological record, don't really have style," explains Fowler. "They are just mundane looking, and don't have decoration or anything like that. The question becomes how do you begin to identify different groups of people and how they interacted, along with other anthropological questions

we want to answer, unless we actually know who's who."

Fowler feels he is one step closer to understanding why archaeological cultures would have the same type of artifact style distributed over a vast area. He has determined the style of making things, such as ceramic pots, varies significantly within a culture, like the Zulu. "Some things potters do are virtually identical, like how you shape a pot, whereas other things like decoration are highly variable," says Fowler. "What that provides for archaeologists is a way to move away from just looking at the object, and begin to try and reconstruct its history and all the decisions that went into making it."

But how do you 'see' these decisions in a vessel? The answer is that the production process must be 'unravelled.'

Observing the construction of vessels is just one part of the process. Fowler brings the collections into the lab (all the pots he has watched being made) and approaches them as would an archaeologist. He effectively reverseengineers the process of making the pot, such as using chemical and mineralogy analyses to look at clay sources and how potters make clay recipes.

During the shaping process, "One thing we've observed is that potters will stop one-third of the way up and then let the vessel dry, and then they start again, and then stop after another third and repeat the process so that the pot doesn't collapse," says Fowler. "We can see these in an X-ray and I've looked at vessels that date back 1,800 to 700 years ago, and they have the exact same lines in the same places."

An 'aha' moment for the researcher was upon realizing what the potters do is not similar, it's identical.

"When I can go in and visit groups of potters and they fashion vessels exactly the same way. They don't know each other, they've never met each other, they are hundreds and hundreds of kilometres apart and they do things identically. It's just fascinating," shares Fowler. "That retention of knowledge and that unchanged aspect of it, that's the next phase of our project. Right now we have a baseline to figure out how far back in time this tradition goes."

To learn more about Nguni Ceramics and Society Project (NCSP), visit http://home.cc.umanitoba.ca/~fowlerk/Research_2.html ■

Kent Fowler

The many stages of the shaping process.


M. Beauregard, MPR-EDT, Government of NU

THE CARVER AND THE GEOLOGIST

BY MELNI GHATTORA

Asked if he is the artistic type, Alfredo Camacho laughs and says, "Maybe creative from a scientific point of view."

Collaborating with artists is nothing new for the assistant professor in the Department of Geological Sciences, "When I was at Queen's University, I used to mix with people who were in art restoration and my dad's an architect, so in a way I've been influenced by art for quite some time now."

Camacho was recently approached by the Government of Nunavut to assist through a scientific lens on a new carving stone resource initiative. The primary goal is to evaluate, identify and quantify the different sources of carving stone that are currently in use so that there will be a recorded document of exactly what and how much is out there (of the materials being used today).

"What they wanted was somebody to be able to, from a scientific point of view, assess the quality of the material. One thing is an objective point of view, which comes from the carvers as they have the experience and a way to determine if this rock is good," explains Camacho. "And of course we are dealing with rocks that, because of their composition, could potentially have asbestos in them. So we're trying to eliminate some of these rocks, so that the carvers' health isn't at risk, since they don't typically wear masks when they're carving."

In addition to Camacho, the Government of Nunavut also courted local artist Jerry Ell to get on board with the Nunavut Carving Stone Project (GN-EDT), an action plan supported through the Department of Economic Development & Transportation. Ell has extensive experience with the quarrying of soapstone, on Baffin Island and in surrounding regions.

A view from the top, Baffin Island, Nunavut. (below): Resting Aiviq, a carving by Jerry Ell.

Ell is a master carver, a skill he picked up from watching his dad and uncles while growing up in Iqaluit, Nunavut. He has been creating fine pieces of art for the last 10 years, and relies on the sales of his work as his primary source of income.

"It's something that I see. I don't know how I do it or how I have that ability but I just see something within the material that


Jerry Ell

wants to come out," says Jerry Ell of his ability to carve much sought-after pieces.

Together, the carver and the geologist embarked on a field study in hopes of increasing carvable stone resources and the volume of carvable material for the Inuit.

"Some places are not good for carving stone, so there's no point for the Inuit to keep going there and to keep looking around in that area. By looking around in areas that might have a small deposit…you can find more rock," explains Camacho. "What we're also looking for are the fluid conduits that will alter that rock to produce the carving stone."

Armed with pocket knives and files, the group set out to Coral Harbour to test for soapstone and, as it turns out, the tip from a local prospector has led to a significant discovery.

"We were able to identify a dolly, and that deposit was around 6-feet wide and about 200-feet long," says Ell. "For every foot it goes down into the ground, that we don't see, that would probably be equivalent to about five to 10 years of material for the artists in Coral Harbor. We calculate that there's at least five year's worth of material and that's good for at least 50 years."

With more than enough materials to spare, can we expect an Alfredo Camacho original anytime soon?

"I don't know. I might give it go," he laughs.

Last summer, Ell sold a 200-pound drum dancer (Ingutak), carved from granite stone, to a gallery in Vancouver and less than a month later Ingutak was purchased by a gentleman from New York.

"At my end here, I received $2,500 for it—I would guess it sold for more than twice that amount. The person in New York probably paid anywhere from $5,000 to $8,000 for it," says Ell, as he laughs at the idea of his art sitting in some fancy New York loft. ■


M. Beauregard, MPR-EDT, Government of NU

Above: Paul Malliki, a Repulse Bay artist, examines black carving stone.

Below:(l-r) Jerry Ell and Alfredo Camacho atop untouched serpentinite deposit.


M. Beauregard, MPR-EDT, Government of NU

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THE IDEA OF A HUMAN RIGHTS MUSEUM

Thinking about an ideas museum: U of M leads human rights conversations

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Centre for Human Rights Research Initiative

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JANUARY 30, 2012

Kiera Ladner, Canada Research Chair in Indigenous Politics and Governance (political studies), Marlene Atleo (education) and CMHR curator Tricia Logan discuss political genocide and how the museum should represent Indigenous rights.

FEBRUARY 13, 2012

Nancy Hansen explores disability rights and CMHR curator Armando Perla talks about agricultural migrant workers.

MARCH 12, 2012

Paul Hess, director of the university's School of Art, explains how conceptual art disrupted the traditional museum and what that means for an ideas museum.

Visit chrr.info to see the full schedule for The Idea of a Human Rights Museum **seminar series.**

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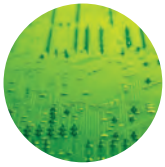
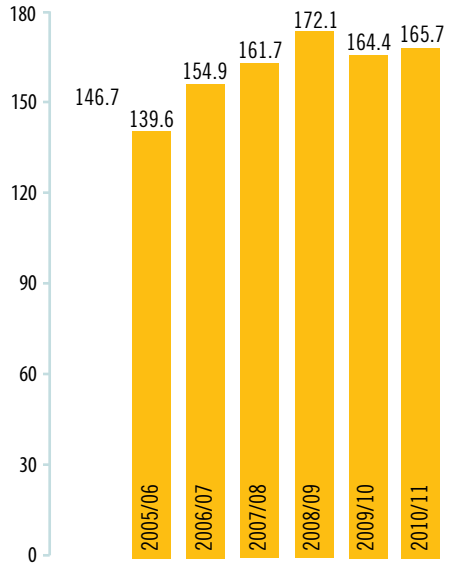


JUST THE FACTS

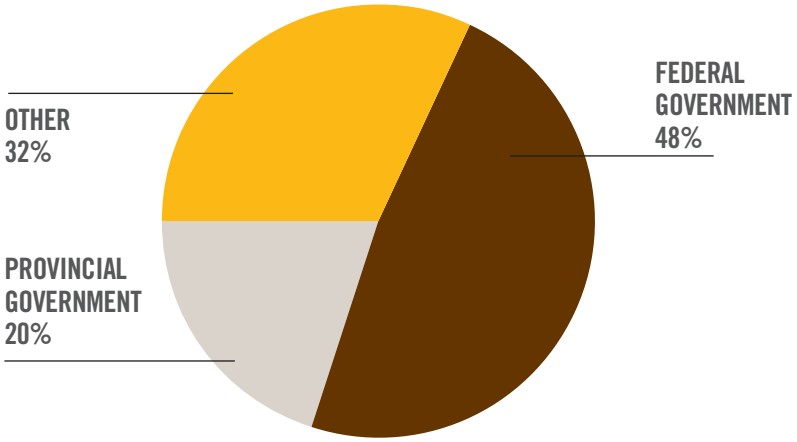
BY THE NUMBERS:

- 73 endowed & sponsored research chairs – including 44 Canada Research Chairs and 1 Canada Excellence Research Chair
- 53 research centres, institutes & shared research facilities
- 8 National Synergy Awards for Innovation
- 16 tenant companies and 10 clients of the **eureka project** in Smartpark, the university's research and technology park
- 123 active licenses
- 476 active patents
- 8,532 staff (20010/11) – 3,922 academic staff; 4,610 support staff
- $537.7 million annual operating budget (2011/12)
- $1.5 billion in building assets

SPONSORED RESEARCH INCOME 2006 TO 2011 ($ MILLION)

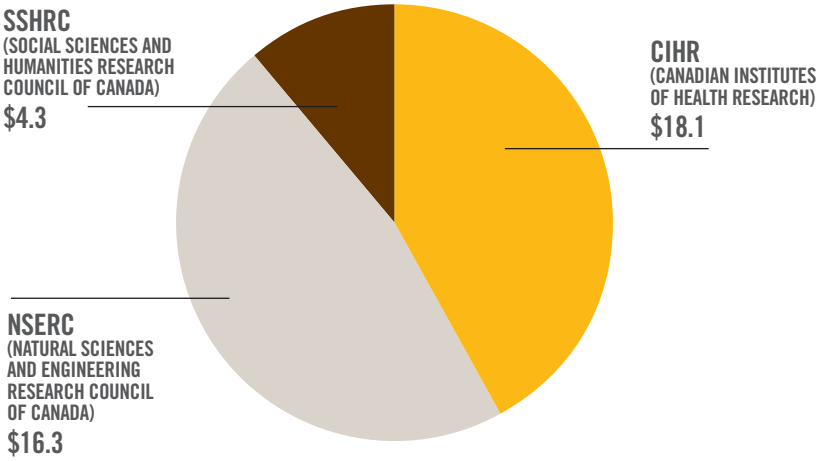


RESEARCH FUNDS BY SOURCE 2010-11



TOTAL: $165.7 MILLION

TRI-COUNCIL FUNDING 2010-11
($ MILLION)



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