Fire and Ice
Passion Ignites Innovative Design

INSIDE:
- Uncharted Territory
- Fluttering Hope
- Smashing Dishes
This issue of ResearchLIFE focuses on research being done by our undergraduate students. They are a talented group of students at the University of Manitoba and we are very proud of them. I’m certain many will go on to lead research programs of their own in the years to come.

This magazine attempts to cover a broad range of research, scholarly activity and creative works happening on a very busy campus. This year enrolment at the University of Manitoba set a new benchmark, with an all-time high of 29,181 students (24,996 undergraduate; 4,185 graduate).

I am continuously humbled and inspired when I review grant proposals and speak with my colleagues about the work they are leading across our multidisciplinary campuses. Passion and inquisitiveness is alive on our ever growing campuses.

The feature stories in this issue cross many disciplines, include unexpected collaborations, and give you a sense of the transformation that occurs when seeking answers to questions. The journey to find those answers requires patience and perseverance, as it can take many years or even lifetimes to reach a conclusion.

I invite you to browse the magazine, stop and stay awhile and meet some of our young trailblazers, visionaries and challengers.

—Digvir S. Jayas, PhD, PEng, PAg, FRSC
FIRE AND ICE
Disciplines Collaborate – The Faculty of Architecture meets the Clayton H. Riddell Faculty of Environment, Earth, and Resources: student Meaghan Kusyk gets the design dream of a lifetime when asked by environmental chemistry and biogeochemistry professor Feiyue Wang for her ideas about building a state-of-the-art research facility. BY KATIE CHALMERS-BROOKS

9 INSIGHTS
Dr. Digvir S. Jayas, Vice-President (Research and International)

19 UNCHARTED TERRITORY
Women’s and gender studies student Ryn Broz teams up with anthropologist Susan Frohlick to learn how travelling affects our sexual identities. BY KATIE CHALMERS-BROOKS

25 FLUTTERING HOPE
Undergrad student Amber Gemmell and Faculty of Science Prof. Jeffrey Marcus probe the genetics of butterflies seeking answers to a deadly form of colon cancer. BY KATIE CHALMERS-BROOKS

29 SMASHING DISHES
School of Art student Lisa Spiers finds out about the day-to-day work of being a full-time artist working alongside School of Art instructor Elizabeth Roy. BY MARIANNE MAYS WIEBE

Happenings ....................3
Kudos ............................5
Centres & Institutes ......8
Hot off the Presses ......15
Ideas to Innovation......17

Viewpoint ......................18
Spotlight on Students ...23
Creative Works ..........29
On the Horizon ...........33
Just the Facts ..............34

ResearchLIFE
RETURN UNDELIVERABLE CANADIAN ADDRESSES TO:
UNIVERSITY OF MANITOBA Marketing Communications Office c/o 540 Machray Hall Winnipeg, MB Canada R3T 2N2 Tel 204-474-7300 • Fax 204-261-0325 ResearchLIFE@umanitoba.ca

CONTRIBUTORS
Katie Chalmers-Brooks, Melni Ghattora, Leah Goertzen, Janine Harasymchuk, Mariianne Mays Wiebe

PHOTOGRAPHY
Cover and throughout: Mike Latschislaw Luc Desjardins, Susan Frohlick, Daniel Gwozdz, Paul Hess, Meaghan Kusyk

Member of the University Research Magazine Association: www.urma.org umanitoba.ca/research
ISSN# 1918-144
AGING WELL, WHEREVER YOU LIVE

THE UNIVERSITY OF MANITOBA’S CENTRE ON AGING IS AT THE HEART OF NATIONAL AND INTERNATIONAL RESEARCH ON THE SUBJECT OF AGING.

The centre is playing a lead role in the Canadian Longitudinal Study on Aging (CLSA). The ribbon was cut on the Data Collection Site for the CLSA in Winnipeg on June 21, 2012. The site is located at Deer Lodge Centre and will allow Manitobans to play a key role in this new and ambitious national study of aging.

“More than 4,400 people from Manitoba will take part in this landmark study of aging, including 3,000 who will participate in in-depth data collection at the Deer Lodge Centre,” said Verena Menec, Canada Research Chair in Healthy Aging and director of the Centre on Aging at the University of Manitoba, and lead site investigator for the CLSA in Manitoba.

The site is a joint initiative of the University of Manitoba, Deer Lodge Centre, Winnipeg Regional Health Authority, and CLSA. Across the country, the CLSA will follow 50,000 men and women between the ages of 45 and 85 for 20 years, collecting information on the changing biological, medical, psychological, social, lifestyle and economic aspects of people’s lives as they age. The study is funded by the Canadian Institutes of Health Research (CIHR) and the Canada Foundation for Innovation. In Manitoba, additional funding support has been provided by the Province of Manitoba Research and Innovation Fund.

Can the place we live become age-friendly? This was the question that sparked discussions at the International Age-Friendly Rural and Remote Communities Symposium on Oct. 15 to 18, 2012. Manitoba Premier Greg Selinger and University of Manitoba President David Barnard were on hand to launch the invited symposium attended by 48 international delegates from 18 countries here to share their experiences and highlight lessons learned in the first five years of the age-friendly community movement. The Centre on Aging co-hosted the symposium with the Manitoba Seniors and Healthy Aging Secretariat, in conjunction with Verena Menec’s Community-University Research Alliance age-friendly communities project funded by the Social Sciences and Humanities Research Council of Canada. The International Federation on Aging; Rural Development Institute, Brandon University; and the World Health Organization were symposium co-sponsors.

Posters were entered in five categories: applied sciences, creative works, health sciences, natural sciences, and social sciences/humanities.

The research by students completed under the supervision and mentorship of faculty members ranged from topics as diverse as the driving habits of older adults to the effects of aspirin on kidney function. Other topics included using dietary flaxseed to treat heart disease as well as nuclear physics in space.

“This competition is an opportunity for undergraduate students to sharpen their skills and showcase research findings to their peers and to the public,” said Digvir Jayas, University of Manitoba vice-president (research and international), who sponsors the competition with cash prizes for first and second place in each category. An additional prize was given by the Qualitative Research Group for the project best describing qualitative research.

This year’s numbers doubled, partially due to the number of students entering posters who completed their research as recipients of the Undergraduate Research Awards program, launched by the Vice-President (Research and International) this past summer.
**Infection Is a Leading Cause of Death for Burn Victims.**

Wound dressings help reduce the risk but the kind that are available today have their limitations. Textiles sciences professor Song Liu (above left) and surgery professor Sarvesh Logsetty (above right) (who directs the Manitoba Firefighters Burn Unit at the Health Sciences Centre) were awarded $384,018 in funding from the Collaborative Health Research Projects (CHRP) program to develop improved wound dressings.

Existing wound dressings contain silver compounds designed to fight bacteria and infection but many adhere to the wound itself, causing further trauma for patients when the bandages are removed. The duo will work to develop a better bandage—using silver nanoparticles (AgNPs), N-chloramine chemicals and hydrogel—that won’t stick to burns but still have an antibacterial component. CHRP grants support research projects that will lead to health benefits for Canadians, more effective health services or economic development in health-related areas, and are jointly funded by the Natural Sciences and Engineering Research Council of Canada and the Canadian Institutes of Health Research.

---

**Fighting the Forces of Nature**

**FLOOD-PRONE MANITOBA IS NOW HOME TO AN INNOVATIVE WAVE TESTING FACILITY THAT MIMICS FLOOD CONDITIONS, ALLOWING RESEARCHERS TO TEST THEIR ARSENAL OF FLOOD-FIGHTING TECHNOLOGIES IN REAL-WORLD SCENARIOS.**

Partnering with the Winnipeg company ITW Syn-Tex Bag, the researchers are testing super-sized, four-foot-tall sandbags called Wave Breakers. They provide a less laborious alternative to traditional sandbags, which to date remain the most used technique despite their limitations.

Conventional sandbag dikes rely on the hard work of many volunteers and have questionable safety and reliability if their construction isn’t strictly monitored. Wave Breakers can go up faster, are installed by qualified personnel and are more resilient to wave action and fast-moving debris.

The 1,000 square-foot wave testing pool designed by civil engineering professors Shawn Clark and James Blatz and their two undergraduate students, Steven Harms and Kevin Sagan, will study how a new type of sandbag dike stands up to forceful waves. The team partnered with the Winnipeg company ITW Syn-Tex Bag, to test their Wave Breakers. The facility was designed in general accordance with the United States Army Corps of Engineers requirements for wave testing.

“As Manitobans, we face more than our fair share of flooding. This research facility will allow us to take a made-in-Manitoba flood-fighting product and test it using established protocols to ensure its safety, effectiveness and reliability, and to make any necessary improvements,” says Clark, principal investigator.

This research is funded by the Natural Sciences and Engineering Research Council of Canada (NSERC) through the Engage program, which is designed to foster new research partnerships by giving Canada-based companies access to the expertise available at Canadian universities. The student researchers working on the project are both recipients of awards: Steven Harms with an NSERC Undergraduate Student Research Award and Kevin Sagan a University of Manitoba Undergraduate Research Award.

---

**Research Integrity**

FOR THE FIRST TIME IN CANADA, A SPECIALIZED ONLINE EDUCATIONAL TOOL—RESEARCH INTEGRITY— IS NOW IN THE HANDS OF STUDENTS, STAFF AND FACULTY WHO CONDUCT RESEARCH AT THE UNIVERSITY OF MANITOBA. The course is a highly interactive online tool designed to provide a comprehensive overview and basic understanding of the best practices and principles in the Responsible Conduct of Research. Each course module is made up of a series of screens containing text, video and technology-enhanced learning activities, real case scenarios, problem solving challenges, and more, in five disciplinary areas: arts and humanities, biomedical sciences, engineering and technology, natural and physical sciences, social and behavioural sciences. Participants work at their own pace: each module takes approximately 4 to 5 hours to complete with additional activities recommended to enhance the learning experience. This new resource was jointly introduced by the Vice-President (Academic) and Provost, Vice-President (Research and International), the Faculty of Graduate Studies and University Teaching Services.
KUDOS

TRANSFORMATIVE HEALTH SCIENTISTS

Three Faculty of Medicine professors who have transformed how we care for people with diabetes, heart failure and organ rejection were inducted into the Canadian Academy of Health Sciences (CAHS). The trailblazing efforts of Heather Dean (pediatrics and child health, and Manitoba Institute of Child Health), Canada Research Chair in Molecular Cardiology Lorrie Kirshenbaum (physiology and St-Boniface Hospital Research), and Peter Nickerson (internal medicine, and immunology) were elected fellows by their peers based on their demonstrated leadership, creativity, distinctive competencies and commitment to advancing academic health sciences. Membership is considered one of the highest honours for the Canadian health sciences community. The objective of the CAHS is to provide advice on key issues relevant to the health of Canadians.

Dean was the first pediatrician to report type 2 diabetes in children in Canada and founded the first provincial, inter-professional, comprehensive program for children with diabetes in Canada: the Manitoba Pediatric Diabetes Education Resource for children and adolescents. Kirshenbaum is best known for his transFormatIvE HEaLtH sCIEntIsts

For Peter Jones, a grocery store can feel like a giant medicine cabinet. The University of Manitoba professor is a leading expert on functional foods, which are those ordinary items on our shopping list that have extraordinary powers when it comes to preventing chronic disease.

These foods have benefits above and beyond simply providing basic nutrients. They contain disease-fighting bioactive compounds (which are naturally occurring chemicals) that can be extracted and packaged in medicine-form and marketed as nutraceuticals. Researchers can also add additional ingredients to these foods to make their punch even more powerful when consumed.

Jones' Tier 1 Canada Research Chair (CRC) in Nutrition and Functional Foods was recently renewed for another seven years, with $1.4 million, to continue his groundbreaking investigations into which bioactive materials make for good ingredients in functional foods. Much of his research involves plant sterols, which are natural components found in plants and known to lower cholesterol. His efforts have led to the international marketing of edible spreads containing plant sterols that reduce heart disease risk by up to 20 per cent. Jones is also studying lipid-lowering actions related to nutrition before and after giving birth and to weight loss.

“Canadians could certainly benefit from learning more about functional foods and the importance of including them in their diet. They could be healthier, have an improved quality of life, and the savings to our healthcare system could be tremendous as we adopt a more preventative approach,” says Jones.

The Government of Canada established the CRC program in institutions across the country more than a decade ago as part of a national strategy to make Canada one of the world’s top countries for research and development. The University of Manitoba is home to 44 chairholders, who do research in the natural sciences, health sciences, humanities, social sciences, and engineering. Jones, who is director of the Richardson Centre for Functional Foods and Nutraceuticals, became a CRC in 2005.
groundbreaking work on viral gene therapy and the regulation of both cell cycle and cell death proteins in the heart and provided a means to genetically modify non-functional proteins in cells that cause human disease. Nickerson, a leader in transplantation science, has been at the forefront in identifying subclinical inflammation as a cause of organ rejection, particularly relating to the kidneys.

UNEARTHING ANSWERS

The Vanier awards help recruit top doctoral students from across the country and around the world and keep them here in Canada. University of Manitoba graduate students Amy Scott and Harlyn Silverstein have each been awarded the prestigious Vanier Canada Graduate Scholarships, with $150,000 each toward their studies and research over three years. With 11 Vanier scholars in the last four years, the university is home to emerging research leaders that are blazing their own unique trails and building a track record of excellence.

An anthropology student, Scott is studying stress within skeletal samples from late to post-medieval Denmark, providing a unique opportunity to examine health and well-being in the archaeological past that will better help us understand the present. Silverstein is a chemistry student studying multiferroic materials, which could make it possible to create much smaller, faster and more energy efficient devices that could increase storage capacity, reduce identity theft and improve sustainability.

Canada’s three federal granting agencies—the Canadian Institutes of Health Research, the Natural Sciences and Engineering Research Council of Canada, and the Social Sciences and Humanities Research Council—administer the scholarships. Students are nominated by their university and evaluated by multidisciplinary peer-review committees and selected by a board of academics and executives. The Vanier program honours distinguished Canadian soldier and diplomat Major-General the Right Honourable Georges Philias Vanier (1888-1967), who served as Governor General of Canada from 1959 to 1967.

MEDICAL LAUREATE

President Emeritus Arnold Naimark (physiology, medicine) will be inducted into the Canadian Medical Hall of Fame in May 2013 for the major role he has played over the past five decades in building health education and research in Canada through the institutes he has led and the programs he has been key in developing.

Naimark’s visionary spirit and extraordinary leadership has changed the face of the University of Manitoba and how patients care in Canada. He co-developed a leading laboratory for the investigation of respiratory disease and the first clinical unit in the world devoted exclusively to intensive respiratory care. He became Dean of the Faculty of Medicine in 1971, creating a new department of family medicine and a division of community medicine. In 1981, he became the university’s president and vice-
Charles Bernstein (internal medicine), a renowned expert on inflammatory bowel disease (IBD), helped put Winnipeg on the map as home to some of the most innovative gastroenterology research in the world. His pioneering efforts were recognized by the Royal Society of Canada (RSC), the country’s top association of scholars and scientists, with his election as a fellow of the RSC, which is considered the highest honour an academic can achieve in the arts, humanities and sciences.

Distinguished Professors Raymond P. Perry (psychology) and Frank Plummer (medical microbiology) were also recognized. Perry received the Konrad Adenauer Research Award, which is given to a Canadian scholar whose research work in the humanities or the social sciences has earned international recognition. Plummer, who holds a Canada Research Chair in Resistance and Susceptibility to Infections, earned the McLaughlin Medal, which celebrates distinguished achievement in medical sciences in Canada.

Bernstein, the founder and director of the Inflammatory Bowel Disease Clinical and Research Center, was first to identify Canada as having one of the highest incidences of IBD globally. The founder and director of the Inflammatory Bowel Disease Clinical and Research Center, Bernstein was first to identify Canada as having one of the highest incidences of IBD in the world. His work has revealed how stress can precede relapses and depression can long precede these diseases, suggesting the nervous system plays a role in the regulation of our digestive immunity.

Perry is known for his contributions to social, educational, and health psychology. His research offers provocative new insights into cognitive and affective processes that govern adaptation across the life-span. He has pioneered cognitive treatment inter-

Established in 1994 and located in London Ont., the Canadian Medical Hall of Fame honours medical heroes of the past, present and future. The national charitable organization creates an enduring tribute to individuals who through discovery and innovation have contributed to improved health in Canada and around the world.

The University of Manitoba has 42 current RSC Fellows.
The Manitoba Centre for Nursing and Health Research (MCNHR) is a research unit within the Faculty of Nursing at the University of Manitoba that promotes and supports the conduct, dissemination and uptake of collaborative nursing and health research.

Formerly known as the Manitoba Nursing Research Institute (MNRI), which was established in October 1985, the name of the Centre/Institute was changed in 2008 to reflect a broader interdisciplinary focus on health research, and to have wider appeal for health care professionals and researchers from disciplines other than nursing to become members of the Centre. The MCNHR currently has over 200 members, including 40 professional affiliates, 61 research affiliates, and over 100 graduate student members.

For more than 20 years, the centre has provided undergraduate nursing students with research experience as research assistants. In 2010, the MCNHR launched the Summer Internship Program, designed to engage and expose undergraduate students to faculty research, thanks to funding from the Faculty of Nursing Endowment Fund. The program invited faculty members to submit an application to work one-on-one with a summer intern.

The program exposes students to a wide range of research activities through involvement in the provision of MCNHR research support services with the added dimension of one-on-one faculty-student research collaboration.

“The vision for the Summer Internship Program was to offer even more meaningful and rich research experiences by being mentored by a researcher and working collaboratively on a research project with that mentor,” says Diana Clarke, director of the MCNHR and associate dean (research) in the Faculty of Nursing.

It’s a win-win situation for all: the students obtain valuable experience and the researchers have much needed assistance to complete the research.

“Working as a summer intern has not only been an invaluable experience, but it has also given me the inspiration and motivation to pursue graduate studies,” says Kristine Popik, who was a 2012 summer intern, along with Rachel Usick, Trevor Farley and Denae Warkentin.

“Working as an intern at the MCNHR is more than just a summer job. It’s an amazing opportunity and privilege to work here with such great people. The intern position at the MCNHR has broadened my view of nursing and has helped me to see my potential as a researcher,” says Denae Warkentin, who was a returning summer intern in 2012 and the recipient of an Irene E. Norwich Foundation Undergraduate Award and Canadian Institutes of Health Research Health Professional Research Award.

For more information on the MCNHR please visit <<umanitoba.ca/faculties/nursing/mcnhr/>>
Distinguished Professor Dr. Digvir S. Jayas was appointed Vice-President (Research and International) in 2011. He was educated at the G.B. Pant University of Agriculture and Technology in Pantnagar, India; the University of Manitoba; and the University of Saskatchewan. Before assuming his current role, he held the position of Vice-President (Research) for two years and Associate Vice-President (Research) for eight years.
Research is critical to society. It is a major factor for the growth and generation of wealth. New ideas come from research: those new ideas get moved into improved products and processes, which results in wealth generation and that in turn contributes to the high standard of living that we enjoy in developed countries.

The University of Manitoba is a research intensive university and therefore provides a unique learning opportunity for undergraduate students to work with the best minds or research leaders in their fields. I believe this exposure opens them up to new possibilities for a research career in university, government or industry sectors.

Research strengthens teaching and learning through the researcher’s work directly feeding into their teaching. They bring the latest knowledge in their field to the classroom. Even though researchers are working in a narrowly defined area, in order to understand that narrowly defined area and to move that research forward, they read the literature related to that research, so that they can stay ahead of the pack with their own research program.

Engaging undergraduate students in research creates inquisitive minds. It sparks questions, debate, discussion in the classrooms on campus, making them active participants. It helps them to make the transition from the theoretical to real world applications and finding solutions.

Many undergraduate students may go through their university education and never experience research. I feel that as the vice-president (research and international) at a research intensive university that it only makes sense to take advantage of the breadth and depth of research going on around campus to change that.

There are approximately 1,200 independent research programs undertaken by professors across campus, which gives our students an edge over students from smaller institutions and even larger institutions, in my opinion. I think our size allows us to offer more students exposure to research, scholarly activity or creative works. We are the first university in Canada to create a university-based award program for undergraduate students, open to students in all fields, to be exposed to research and providing that funding centrally through the Undergraduate Research Award—or Experience Research—as we refer to it. Undergraduate students can apply and compete for 80 awards that put them in research settings, whether that be in a research lab, or doing scholarly or creative activities.

There were hundreds of applicants in 2012 when the award was launched. A key component of the application is that each student must interview two professors about their research program and then write a short summary of what each is doing and then choose which professor they would like to spend the 16 weeks of the award period. They are mentored and supervised by the professor. In theory, if we had 300 applicants and they each interview two researchers, those 300 students, whether they were successful in obtaining an award, would now have been exposed to 600 research programs. Cumulatively, that would compound year-over-year and result in thousands of students leaving the University of Manitoba with an appreciation for research.

The students, at the end of their award period, are then encouraged to present their research findings at the annual Undergraduate Research Poster Competition, which helps students build their skills in communicating research in a layperson-friendly manner.

In my wildest dreams I would like to be able to provide the Undergraduate Research Award to 500 students. The only limitation is the funding, and that is why we have created the application process to maximize the exposure of students to researchers.

The University of Manitoba brings in approximately $160 million in sponsored research income annually and that funding is spent on supporting graduate students, with many professors also using their grant funds to support undergraduate students for research projects.

For the Canadian economy to grow, encouraging undergraduate students to consider graduate programs is imperative. The life sciences, biomedicines, and food industries are just a few examples of industries that need workers with masters and PhD degrees to grow not only our own knowledge economy but that of any nation.

My goal is that every student should be provided an opportunity to learn about research at University of Manitoba in the many different facets of its enterprise. Exposure to the transformative experience that research provides to a students’ personal growth and the contribution to society is paramount.
Disciplines Collaborate – Faculty of Architecture meets Clayton H. Riddell Faculty of Environment, Earth, and Resources with the research pairing of student Meaghan Kusyk and Feiyue Wang, professor of environmental chemistry and biogeochemistry.
Passion Ignites Innovative Design

Words can barely keep up with Meaghan Kusyk. In a pace that is equal parts happy and hurried, she does her best to articulate how she, an architecture student who loves science and who has been fascinated by ice since she was a little girl, wound up being asked to design a state-of-the-art ice research facility for the University of Manitoba. The project—hypothetical for now—would allow scientists to mimic oil spills in the Arctic and then figure out how to deal with such a catastrophe.

“It’s been a dream,” says the 24-year-old. “It’s relevant and exciting and something that is helping researchers move forward.”

Kusyk was awarded an Undergraduate Research Award to determine—if money were no object—how best to build a research centre on the Fort Garry campus where scientists could develop and test techniques to contain and clean up oil spills should they occur in the North. Her supervising professor, Feiyue Wang, the principal investigator at the university’s $1.5 million Sea-ice Environmental Research Facility (SERF), says while this second ice testing facility may be theoretical for now, Kusyk’s research results and renderings have prompted him to begin work on a proposal for the real thing.

That’s icing on the cake for Kusyk, who is still reeling from her good fortune that such a project presented itself in the first place. It’s an opportunity—which Wang said wouldn’t have been possible without the Award—that Kusyk had unknowingly spent years preparing for. “It’s been unreal. It’s been the craziest coincidence,” says the fourth-year student.

Even before the U of M became the global authority on sea ice with the opening of SERF, Kusyk was dreaming up ways to meld her passion for architecture with her passion for ice. Flipping through her portfolio from her first years in architecture, she talks about her “obsession” with the intricacies and possibilities of using frozen water in design. For her major annual projects she dreamt up plans for a unique pumping system adjacent to a home that would use melted snow and ice for energy; and an experimental testing lab—in the Arctic—where scientists could research how to build under water using ice. Experimenting with how objects transform once frozen came next. Kusyk would create temporary structures by taking all the bed sheets from her East St. Paul home, dunking them in water and—with the mercury dipped to -30°C—draping them outside over objects like chairs or propped pieces of wood. She loved how the fabric hardened immediately and when lit from inside glowed with habitability. She also dragged outside all of her
mom’s pans (which she had filled with water) in order to create unconventional building blocks, and incorporated lit sparklers within the unusual, frozen-solid creations.

“It looked like a lightning storm,” she says. “I was up night after night. It was the most amazing mad-scientist thing. It was the most fun I ever had.”

Kusyk unleashed the same enthusiasm for her project for Wang. An environmental scientist, he explains how more interest in industrial development in the Arctic has meant more queries from oil companies about research into how to clean up spills in ice-covered waters. SERF (which is funded by the Canada Foundation for Innovation, the Province of Manitoba Research and Innovation Fund, and the U of M) is equipped to grow ice to study its physical and chemical processes and to better understand its role in climate change, but adding oil to the mix would require a more specialized facility. Wang wondered what it would take to build another saltwater pool adjacent to SERF, “a fire and ice pond” specific to analyzing oil spills. It would have to be enclosed given that typically the quickest way to contain oil is to burn it. The year-round refrigerated building, if even doable on a suburban campus, would require sophisticated air purification systems to capture and clean the smoke before releasing it. Careful consideration would be given to figure out how to manipulate fire indoors safely, and to choosing fireproof materials.

Several weeks and two binders chock-full of research notes later, Kusyk came up with a design that takes into account the unusual, practical requirements as well as an interesting aesthetic. The main components? An eight foot deep, 60 foot long and 30 foot wide concrete wave pool that simulates the movement of the ocean; electric arms to release the oil and to ignite the fire; a giant fume hood leading to an intense air purification system; and non-flammable liners for the pool that researchers can remove to analyze residue. Kusyk paid extra attention to distances between the flames and structural elements like ceilings and walls.

There are very few facilities in the world devoted to this type of research and none in Canada. The biggest challenge, Kusyk says, was sifting through the technical details of complex mechanical systems. They present a challenge design-wise as well, but she grew intrigued by how function predicts form and decided that everyone—including passersby outside—should be able to see the facility’s inner workings. She could use only so much glass (since it’s an energy loser) so she opted instead for translucent concrete. “I’ve been doing a lot of reading about innovative materials,” Kusyk says.

Wang believes one day the U of M will have in their arsenal such a facility, providing scientists with another small slice of the Arctic on the Prairies. The need is there, he says. As our world gets warmer, there is less ice and more open water in the Arctic which makes it easier for industry
The animals—and the people—living in the Far North are already dealing with considerable change that’s coming at them with growing momentum.

to navigate and explore. “We know that the oil industry is taking shape in the Beaufort Sea whether we like it or not. We know it’s just a matter of time before we will see drilling in the Arctic Ocean,” Wang says. “When there is drilling, there is always the chance of an oil spill. We all have fresh memories of the Gulf (of Mexico) oil spill. Imagine something of that magnitude occurring in the Arctic Ocean? What will be the environmental implications?”

Because of the cold, the oil may not disperse and dissipate as easily as it would in warmer water. Researchers also don’t know how the ice will affect typical burning practices. And if an oil slick wipes out even one Arctic species, it could have greater repercussions than you would find elsewhere since its ecosystem is much simpler and more sensitive to changes. “If one species does not do well, then it could be a disaster to the entire ecosystem,” says Wang.

The animals—and the people—living in the Far North are already dealing with considerable change that’s coming at them with growing momentum. Wang, who got his start studying contaminants in fresh water (in Chinese rivers and Canadian lakes), first arrived in the Arctic eight years ago when scientists had predicted it would be ice free during the summer by 2100. That date has since been revised several times; they now say it could be anywhere between 2015 and 2030. “Things are happening so fast, faster than any of us anticipated,” says Wang, noting that annually the Arctic loses a section of ice the size of Lake Superior.

Global warming is complex as are its effects. Increased carbon dioxide in the atmosphere worldwide—from natural or manmade sources—is most to blame; this gas traps the heat emitted from the Earth and increases the planet’s temperature. It doesn’t help that there’s less white ice to reflect the sun’s rays away and more black ocean absorbing all that heat. The resulting warmer water then melts more ice, messes with how the world’s oceans circulate and changes weather patterns (more tropical storms).

Some say reducing emissions would at least slow down the warming of the planet. “Some people say we are already at a point of no return. But there really is no consensus that we have passed this point,” says Wang, a father of two who admits the consensus that we have passed this point, “the hope is that there might be other negative feedback in nature that could potentially help.”

His specialty involves mercury, a toxin which for years has accumulated in Arctic waters and has been detected in area fish, mammals, and—of most concern—the humans who eat them. Mercury likely made its way here from as far back as the early 1900s in the form of pollution from industrial sources like coal-burning plants. It was Wang and his colleagues who realized that today’s high mercury levels in Arctic marine mammals are not all from additional pollution but rather from changing geochemical and biological processes identified in the area which release the ‘legacy’ mercury that has accumulated from the past. For instance, scientists suspect a phenomenon known as frost flowers (shown on page 12) plays a major role in converting mercury from the atmosphere into a form that deposits in the ocean and accumulates in the food chain.

These frost flowers, which range from needle to fern-like ice crystals, grow on sea ice that is newly formed from open water, and not on multi-year ice that has been frozen for more than one year. With the planet getting hotter, the majority of the Arctic sea ice is no longer thick, multi-year ice so frost flowers are more abundant, which means more mercury could get deposited in the water. Wang and his colleagues unintentionally became the first to grow frost flowers in an outdoor pool—at SEF—and record their three-day evolution and demise. A dramatic shift in temperature one February morning in 2012 turned the newly filled outdoor pond into a “complete wonderland,” Wang says. The phenomenon of frost flowers is difficult to study in the Arctic since it’s hard to predict where the crystals will form and their short lifespan means that by the time a ship reaches them, they would likely be gone. Wang hopes to replicate this growth this winter and do further study.

“They blossomed in front of our eyes,” he says, admitting he found himself coming back to SERF in the wee hours, not wanting to miss anything.” It was like I was a student again.”

Kusyk can relate to his fervor. She says that during the planning of what may one day become SERF’s sister facility there were some “sleepless nights.”

“You get so excited about things,” she says. “When you do research, you see all the possibilities, and then you want to do even more research.”
SEXUALITY, WOMEN, AND TOURISM: CROSS-BORDER DESIRES THROUGH CONTEMPORARY TRAVEL
(Routledge, 2012)
Susan E. Frohlick • anthropology, women’s and gender studies

This book is the first to focus on why and how foreign Western women engage in cross-border sexual and intimate relations as tourists travelling, or temporarily dwelling, in a Central American country. As an in-depth ethnographic account, the book traces the experiences of heterosexual North American and European women’s transnational encounters, and examines new sexual and social practices arising from contemporary global tourism, shifting sexual cultures both at home and abroad, consumer culture, and women’s increasing mobility. The book combines descriptions of women’s travels and sexual relations across racial and class boundaries with feminism, postcolonial theory, and poststructuralist theories of gender and sexuality, to show how tourism as a wide range and set of desires serves as a central shaping force in the formation of women’s sexual subjectivities in contemporary life in postindustrial capitalism. In doing so it offers new insights into how tourist women express heterosexuality shaped by gender, race, class, and identities.

This fascinating book, focusing on the structure of tourism and role of local culture and social organization in the shoring-up of desire, develops a unique contribution to the understanding of sex tourism. It will be of interest not only to tourism scholars, but also to those interested in sexuality, anthropology, sociology, cultural studies, women studies, gender studies, and geography.

Epidemic Encounters: Influenza, Society, and Culture in Canada, 1918-20
(UBC Press, 2012)
Magda Fahrni (Université du Québec à Montréal) and Esyllt W. Jones • history

Health crises such as the SARS epidemic and H1N1 have rekindled interest in the 1918 influenza pandemic, which swept the globe in the wake of the First World War and killed approximately 50 million people. Now more than ever, medical, public health, and government officials are looking to the past to help prepare for future emergencies.

Epidemic Encounters zeroes in on Canada, where one-third of the population took ill and 55,000 people died, to consider the various ways in which this country was affected by the pandemic. How did military and medical authorities, health care workers, and ordinary citizens respond? What role did social inequalities play in determining who survived? To answer these questions as they pertained to both local and national contexts, the contributors explore a number of key themes and topics, including the experiences of nurses and Aboriginal peoples, public letter writing in Montreal, the place of the epidemic within industrial modernity, and the relationship between mourning and interwar spiritualism.

The Canadian experience brings to light the complex ways that biology, science, society, and culture intersect in a globalizing world and offers new insight into medical history’s usefulness in the struggle against epidemic disease.

Fighting Words and Images: Representing War Across the Disciplines
(University of Toronto Press, 2012)
Edited by Elena V. Baraban, Stephan Jaeger • German and Slavic studies, and Adam Muller • English, film and theatre

Fighting Words and Images is the first comprehensive interdisciplinary and theoretical analysis of war representations across time periods from Classical Antiquity to the present day and across languages, cultures, and media including print, painting, sculpture, architecture, and photography.

Featuring contributions from across the humanities and social sciences, Fighting Words and Images is organized into four thematically consistent, analytically rigorous sections that discuss ways to overcome the conceptual challenges associated with theorizing war representation. This collection creatively and insightfully explains the nature, origins, dynamics, structure, and impact of a wide variety of war representations.
YOUTH AT RISK AND YOUTH JUSTICE: A CANADIAN OVERVIEW
(Oxford University Press, 2012)
Edited by John A. Winterdyk
(Mount Royal University) and Russell Smandych • sociology

Written by highly regarded Canadian experts on youth crime and justice, this contributed text offers an engaging and relevant introduction to juvenile delinquency in Canada. Offering students a solid foundation to the fundamentals of the field, the book also explores a wealth of timely topics—such as restorative justice, the sexual exploitation of adolescent men, and Quebec’s approach to youth justice—which are essential to understanding the current state of youth crime and justice in Canada. Examining the patterns, theories, and emerging trends surrounding the topic, Youth at Risk and Youth Justice is required reading for understanding the cycle of victimization and criminal behaviour affecting many young people.

DISASTER RISK AND VULNERABILITY: MITIGATION THROUGH MOBILIZING COMMUNITIES AND PARTNERSHIPS
(McGill-Queen’s University Press, 2012)
Edited by C. Emdad Haque • Natural Resources Institute and David Etkin (York University)

From the Asian tsunami of 2004 to hurricane Katrina in 2005 and the Tohoku earthquake of 2011, our century has been fraught with catastrophic natural disasters. Disaster Risk and Vulnerability assesses the human toll and economic losses of natural disasters and reasserts the importance of human collaboration and organization in disaster management.

In most cases, policy-makers, planners, managers, and regulators who implement disaster risk reduction response planning and management strategies remain detached from local conditions, failing to address them effectively. Presenting case studies from Asia and North America, as well as a broad range of approaches to community mobilization and partnership development, contributors show that local communities, all levels of government, and non-governmental organizations must work collectively in order to reduce the harm caused by disasters.

Despite unprecedented progress in science and technology and governments’ continued efforts in disaster risk reduction, socioeconomic losses due to environmental disasters continue to rise. Disaster Risk and Vulnerability provides knowledge and information that will benefit anyone working in the fields of environment, disasters, and community mobilization in an effort to reverse this trend.

FINDING A WAY TO THE HEART: FEMINIST WRITINGS ON ABORIGINAL AND WOMEN’S HISTORY IN CANADA
(University of Manitoba Press, 2012)
Edited by Robin Jarvis Brownlie • history, and Valerie J. Korinek (University of Saskatchewan)

When Sylvia Van Kirk published her groundbreaking book, Many Tender Ties, in 1980, she revolutionized the historical understanding of the North American fur trade and introduced entirely new areas of inquiry in women’s, social, and Aboriginal history. Using Van Kirk’s themes and methodologies as a jumping-off point, Finding a Way to the Heart examines race, gender, identity, and colonization from the early nineteenth to the late twentieth century, and illustrates Van Kirk’s extensive influence on a generation of feminist scholarship.

DESPERTAR DE LAS COMUNIDADES AFRO-COLombIanas THE AWAKENING OF AFRO-COLOmbIAN COMMUNITIES
(LaCasa Editorial – University of Houston; CIS (Centro de Investigaciones Sociales), Universidad de Puerto Rico, 2012)
María Inés Martínez • French, Spanish and Italian

The book is a compilation of edited testimonies of struggle of five of the most important leaders of the Afro-Colombian community. The five fascinating stories raise important questions, such as racial and cultural differences, and how these differences were reflected in the economic and development practices of Afro-Colombian communities. The testimonies also speak to the confrontation of these communities with the predatory practices of large corporations that have devastated their communities, their territories and its environment. All the testimonies include references to historic, economic and social discrimination, and the current situation of displacement, which have left the communities in a vulnerable state. Prof. Martínez also writes an introduction that situates the historical context of the struggles of Afro-Colombian communities and its demands for social justice. This struggle led to the adoption of the landmark Law 70, which recognized the collective territorial rights of Afro-Colombian communities, but was countered by a tidal wave of state-sanctioned violence.

In the words of distinguished anthropologist Arturo Escobar, The Awakening of Afro-Colombian Communities, “provides a vivid and profound portrayal of the resurgence of collective black identities, one of the most important developments among Latin American social movements in the past 20 years”.

The book also has an introductory essay by Prof. Angel G. Quintero Rivera, of the CIS (Universidad de Puerto Rico), that places the importance of these testimonies within the context of Afro-American studies.
WHAT DO YOU GET WHEN YOU COMBINE AN ANCIENT, CLASSICAL INSTRUMENT—THE VIOLIN—WITH LIVE ELECTRONIC MUSIC?

“A big contrast,” says second-year Marcel A. Desautels Faculty of Music student Viktoria Grynenko.

That’s what the 21-year-old violinist sought when looking for new material to perform. She’s teaming up with U of M composition student Zach Bales to bring this unconventional pairing to life.

Bales will compose two parts: one for the violin and one for the computer. (He works with Prof. Orjan Sandred in Studio-FLAT, a computer-assisted composition lab funded through the Canada Foundation for Innovation and Province of Manitoba). He will program the software to tell it how to react to Grynenko’s playing during a live performance. The computer will record the sound coming from Grynenko’s violin in five-second clips and then play that sound back five seconds later but do so at a slower or faster pace. Changing the speed of the playback either heightens or lowers the pitch, making for a unique duet. “It’s interactive computer music. The computer is responding to the music that is being played,” explains Bales.

He was thrilled to get involved in the project, given how uncommon it is for classical music students to seek out new works. “To have someone like that excited about a project like this is exciting to me,” the 20-year-old says.

An international student from Kiev, Ukraine, Grynenko first arrived on campus last year. She’s been playing the violin since age seven, once her piano teacher realized she had perfect pitch. “My approach is very classical,” she says, likening playing to acting. “You can show all of your emotions with the violin. Each piece is like a little play. There’s a whole story there.”

Bales’ love of composing first surfaced when he was a teenager, writing parts for bass guitar and drums while jamming in his friend’s basement. He started with classic rock but grew into jazz and classical music.

The collaboration is a first for both Grynenko and Bales; neither have worked on a live electronic piece before. Bales is more accustomed to writing parts for the flute or piano. He admits this style isn’t for everyone. “It’s a strange sound and a strange concept and sometimes people are put off by that. The idea of computers and music put people off in some way,” he says. His goal is straightforward: create something beautiful. “I want to write something that sounds good to me and that I think people will like.”

Bales gets a kick out of developing his very own “sound world” and then “finding a way to express that to an audience.” His piece is one of three live electronic compositions Grynenko will play during a performance scheduled for the New Year (Marcel A. Desautels Faculty of Music student David Betz is also writing a piece. The third piece is with composer Henry J. Ng). Grynenko is excited about showcasing the violin in a different way. “It exaggerates the sound coming from the violin,” the performance student says. “It’s all a very new experience.”
It wasn’t until I was deep in the rainforest did I feel a familiar peace in Uganda. The Ugandan rainforest reminded me of time spent in British Columbia. My degree program in Recreation Management and Community Development created the opportunity to live in Uganda for six weeks for my fieldwork experience. I had the opportunity to visit Ruhija Gorilla Friends Resort and Campsite. This resort was part of a collaborative research development project by professor Michael Campbell at the University of Manitoba.

The connection to the wilderness made me feel at home in this foreign land. However, living the next six weeks in the bustling city of Kampala allowed me to understand the process of ‘culture shock’ living on a new continent.

The process of ‘culture shock’ that I experienced intrigued me. Looking back, I wondered what aspects of engagement would create a sense of belonging most effectively? When I returned to Winnipeg I was more aware of Canada’s immigrant population and I wondered what their experiences were when adjusting to a new place. How could I assist these members of our community with integration in my chosen profession? I was motivated to work with professor Campbell, with the support of a University of Manitoba Undergraduate Research Award, exploring how outdoor recreation could facilitate developing a sense of place for immigrants in Canada. The research project involved analyzing a Parks Canada Learn to Camp program at the Lower Fort Garry Historical Site. This experience introduced to me the practical aspects of qualitative research in my field. For example, I learned the relevance of incorporating a theoretical framework into research and evaluation.

This research taught me important considerations for my future career in recreation management and community development. Qualitative research provides complex documentation of how people experience a given research issue. It provides information about the ‘human’ side of an issue including behaviours, beliefs, opinions, emotions, and relationships of individuals. Qualitative methods are also effective in identifying intangible factors, such as social norms, socioeconomic status, gender roles, ethnicity, and religion, whose role in the research issue may not be evident.

Research is not simply for researchers in the academic realm. Incorporating research methodology into a career allows a person to build on past experiences to produce innovative results. It allows planners to understand their target populations through experiential research data when communication is not possible. Social science research is an integral component of community building and I am inspired to pursue research based on this experience.
Researchers uncover how travelling—as new immigrants or vacationing tourists—affects our sexual identities

BY KATIE CHALMERS-BROOKS
When young people emigrating from Africa first arrive in Winnipeg, they have with them more than just their luggage. They come to Canada with their beliefs and their values, influenced by their culture and their families. This includes ideas about sex and their own sexuality. Some don’t believe in intercourse before marriage; some come from a country—Nigeria—where homosexuality is illegal; some are expected to be paired up through arranged marriage; some of the young women have undergone genital mutilation, a ritual that in their culture represents femininity; and some figure their chance of contracting HIV in Canada is negligible, having grown up on a continent with the highest infection rates in the world.

Due to these complexities, it’s no wonder educators find it difficult to know what messages will most effectively promote safer sex to these individuals. Susan Frohlick, professor of both cultural anthropology and women’s and gender studies at the University of Manitoba, is giving young immigrants a voice and by doing so gaining valuable insight into their struggle. More than 50 teens and adults in their early 20s have been interviewed to date. Most of them are from low-income families in Winnipeg’s inner city.

“We’re looking at how the sexual lives and the sexual identities and practices of African newcomer youth are affected by the immigration process and being here in Canada. These are youth who are having to navigate between two very different worlds and norms around gender and sexuality,” says Frohlick. “What this project is really about is how we can give them culturally appropriate, culturally sensitive messages that don’t judge them and will resonate with their lives.”

Frohlick’s student Ryn Broz, who devoted her summer to this assignment thanks to an Undergraduate Research Award, knows the value of a candid conversation about sex and gender, especially one that keeps in mind the needs of its audience. As a gay teenager who came out at age 13 she couldn’t relate to the messages she heard in sex-ed class at school about safe, heterosexual intercourse. “To create programs related to HIV/AIDS education, you really need to understand who you’re marketing to, how they’re getting their information, how that’s developed,” insists Broz.

Costa Rican town where Frohlick does her research.
The fourth-year women’s and gender studies student has a good idea about the latter for this specific group, having transcribed and made observations about dozens of interviews done in the last two years by Frohlick and young African immigrants trained as peer researchers. Broz learned about the mixed messages these young people say they get from their families, the media, their university classmates and their friends.

The finding that might be the most troubling? Some of them are greatly underestimating the risk of contracting a sexually transmitted infection (STI) on Canadian soil. “That can be dangerous because it disregards safety if people don’t feel there is a risk, that there is less reason to be careful, to be worried, and that would lead to higher rates of infection,” she says.

Frohlick attributes this to young immigrants buying into a stereotype that Canada is extremely “open,” and that Canadians “have sex all the time” and are very knowledgeable about their sexual health. “Some of the youth have assumptions that if they sleep with a Canadian girl, let’s say, that’s what Canadians do, right? So you can see how that misunderstanding leaves them really vulnerable because obviously that’s not the case,” Frohlick says.

This was Broz’s first research job; she liked how the project, funded by the Canadian Institutes of Health Research, reached right into the community and had its members actively participating on both sides of the interview table. Many of these meetings were held at the Sexual Education Resource Centre, a non-profit agency on Osborne Street North in Winnipeg.

Frohlick says she learned a great deal— and is still analyzing her findings—as did the interviewees since she arranged for a sexual health educator to come and speak with them on occasion. She also had Broz compile a comprehensive database on sexual health-related services available for immigrant youth in Manitoba, which identified considerable gaps.

But what struck Broz more than the lack of services that exist was the homophobia that reared its head during many of the interviews she listened to. Individuals revealed how they saw homosexuality as something that is related to race. “What I found really disturbing was how they constructed homosexuality as white. There are a lot of issues of not representing people of colour as being gay and especially people from other countries as being gay. People see it as a cultural betrayal,” says Broz, who also noted that no one interviewed identified themselves as anything other than heterosexual. With Frohlick’s encouragement, Broz found a university-aged, openly queer African immigrant to add to the interview pool and, after undergoing methodology training by Frohlick, conducted the meeting herself.

Frohlick applauds Broz’s zeal, calling her “incredibly bright” and “very thoughtful,” and was happy to have her help out with another of her major research projects, which also looks at the interplay between sexuality and mobility. This one, funded by the Social Sciences and Humanities Research Council of Canada, has Frohlick zeroing in on Costa Rica and the sexuality of tourist women from North America and Europe who pair up with local Afro Caribbean men while on vacation. The region is popular with young backpackers and is known for its adventure tourism and packaged tours targeted to women. Frohlick wants to know: “What kind of implications and effects does mobility have on the formation of gender and sexuality?”

“We’re looking at the kinds of intimate and sexual relations that have evolved out of tourism coming into this community in the last 25 years,” Frohlick explains. She interviewed more than 60 of these mostly heterosexual women, many of them in their early 20s, and some of the young men they meet, providing a window into this complex dynamic. Foreign women get a lot of attention from the local men and these unions have a big influence on how they see themselves as sexual beings. These encounters also prompt the tourist women to think about their race. “White women don’t necessarily think about white as part of who they are. But in these transnational kinds of encounters, whiteness just has this incredible social value so they certainly see themselves in those terms.”

It’s not your typical sex tourism scenario at play, Frohlick says. But essentially tourist women buying gifts for their local boyfriends and paying for their beer and food have become common local practice. What comes as a surprise to the women is that the local men are looking for a long-term relationship rather than a travel romance. Frohlick says the men in this developing country see it as “kind of an investment.”

“And then women begin to understand the political economic structures that are influencing the men’s interest in them and that’s always a shock.”

The majority of these unions last more than one visit but not with any monogamy. And a small percentage involved physical abuse. It was Broz’s job to search for newspaper and journal articles that looked at violence against tourists in Costa Rica. Frohlick says intimate partner abuse doesn’t appear to be on the radar of area police or the Canadian embassy. The women she met indicated they didn’t know where to turn for help.

Frohlick wants to go back to the Central American country and do further interviews, this time exploring the impact of tourism coming into this community. Foreign women get a lot of attention from the local men and these unions have a big influence on how they see themselves as sexual beings.
of these encounters on the local Afro Caribbean and Costa Rican women. Most of the men involved with tourists have girlfriends, wives and children at home. Tourists tend to be naïve about the local social structure, assuming the guys they meet at the bar are single, Frohlick says.

“We talk about the social impacts of tourism. We talk about the environmental impact or the political economic impact but the gender and sexuality impact is not well understood and it’s not talked about.”

It’s uncovering uncharted territory like this that motivates Broz to pursue a career in academics. She wants to do innovative work in women and gender studies that will trigger positive change. She views research as a “tool to share voices, to share experiences, to share knowledge.” And there will always be a need to do so.

“There’s so much room for improvement in our world right now,” Broz says.
REAL WORLD PROBLEM SOLVING

BY MELNI GHATTORA

This past summer, Manitoba reported its first infant death from pertussis (commonly known as whooping cough) in more than five years. In the last two years there has been a resurgence of this illness, which is the second most frequently reported, vaccine-preventable disease in Canada. The United States was hit especially hard; in 2010 California reported the largest outbreak of pertussis south of the border since the end of the Second World War.

Matias Wengiel, a second-year medical student in the B.Sc. (Med) program opted to spend his summer investigating whooping cough and returned in the fall with a greater understanding of what it takes to research an infectious disease.

The B.Sc. (Med) program was formally introduced in 1948 under the direction of Joe Doupe [MD/34]. It’s a two-year course designed to give medical students an opportunity to engage in original research, either basic or clinical. The entire process is a collaborative endeavor. Students receive guidance and feedback from their mentor throughout the duration of the program, as well as a stipendiary (which is almost entirely externally funded).

Wengiel worked under the supervision of Sergio Fanella, an assistant professor in the departments of pediatrics and child health, and medical microbiology; and program director for the Pediatric Infectious Diseases Training Program. Fanella’s research abstract proposal titled “Assessment of Knowledge, Awareness, and Attitudes towards Pertussis and Pertussis Immunization Strategies in Post-partum Mothers” intrigued Wengiel, who had a longtime interest in infectious disease.

“When I was accepted into the Faculty of Medicine, I knew I wanted research to be a part of my learning experience here and also my future career,” says Wengiel.
“Currently the recommendations are to vaccinate children at two, four, and six months with a vaccine called DTap,” Wengiel explains. “We’re particularly concerned with children under two months of age who have not received any of their immunizations. They would not be protected if exposed and infected with whooping cough, which can be particularly dangerous, even fatal, for young infants. In the United States, national immunization committees recommend all expectant mothers be immunized against pertussis. Some jurisdictions in Canada experiencing large pertussis outbreaks have followed suit. Fanella wanted to know how pregnant women in Manitoba would react if this needed to be implemented in Manitoba. “We wanted to get a bit ahead of the curve,” he says. “The reason we came up with this project is because over the last year we seemed to have been seeing more cases of infant pertussis in our pediatric population.”

The first step in the research process for Wengiel was the review of hospital charts. He was specifically looking at cases where infants had been hospitalized with laboratory confirmed pertussis within the last five years. He incorporated this data into a survey, forming questions he then posed to post-partum moms.

With the help of the hospital staff and nurses on the obstetrical wards at the Health Sciences Centre Women’s Pavilion, Wengiel spoke to new moms to find out: how much they knew and what they understood about pertussis, how they would feel about a recommendation of immunization during pregnancy, and what might be some of the reasons they would either accept or not accept being immunized during pregnancy.

“We have seen with influenza vaccination—and that’s been recommended for pregnant women for a few years now—that the rates of up-take in pregnant women have been very low for a variety of different reasons and we don’t know if that would potentially be the same with pertussis immunization with pregnant women,” Fanella explains. “Knowledge from this survey could be used to anticipate and avoid roadblocks in any future pertussis program in pregnant women.”

It was important to Fanella to give Wengiel the opportunity to develop this research project from scratch. This required Wengiel to secure the necessary approvals of the University of Manitoba’s Research Ethics Board (REB).

“I had the general concept and outline of the proposal but Matias did a lot of the groundwork including the application and submission to the REB, the application to Health Science Centre Research Impact Committee, as well as designing the specific questions for the survey,” says Fanella.

The researcher recalls how these types of tasks resulted in a bit of a culture shock early on in his own research career. Wengiel was grateful for his mentor’s guidance and insight. “Learning about the administrative side, the paper work and how to get through it was actually a really good learning experience. It exposes you to all aspects of conducting research,” Wengiel says.

He will present the collected data at the B.Sc. (Med) dissertation day during the third week of August, 2013. There are also opportunities for him to share these findings at national or international meetings and conferences, or complete a formal manuscript for submission to a peer-reviewed journal.

“If I feel like I am contributing to the research field, and not that I am only doing research because I get this B.Sc. (Med) designation at the end of it,” says Wengiel. “This early in our careers, some of us have a tendency not to value our own work as high as we should; but here I do feel I am doing something important.”

The B.Sc. (Med) program runs for 13 weeks during the summer break after year one and two of medical school. Its aim is to develop skills in experimental design, hypothesis testing, the critical evaluation of data and the effective communication of results. Prospective B.Sc. (Med) students have the opportunity to review all approved abstracts through an online catalogue. Once they find a project (or projects) that interest them, they contact the respective supervisor. Once all is a go, the student/faculty research team submits a proposal to the approval committees.

“I would encourage students, if they have given research a thought, that this is something they should at least consider, even if they’re not 100 per cent sure,” says Fanella. “A lot of the clinical data that we have and a lot of clinical guidelines and pathways used in day-to-day practice, that originates from research, whether it’s clinical or basic science research in a lab.”

Faculty of Medicine Researcher Sergio Fanella.
Fluttering HOPE

BY KATIE CHALMERS-BROOKS
When a passing student wants to know what he’s up to, Marcus explains he’s catching butterflies to study their genetic properties. “Thanks for asking,” he says while safely tucking away his newest specimen.

To Marcus, butterflies are more than just a pretty insect. He believes they hold the key to unlocking the genetic code of an inherited form of colon cancer, one that if undetected kills family members before middle age. It’s an unlikely pairing: beautiful butterflies known for their feel-good symbolism of transformation and renewal and a cancer so ugly it never skips a generation in a family afflicted. But the butterfly, like all multi-cellular animals, has the same genetic pathway that is responsible for the rampant growth of polyps in the colons of people with adenomatous polyposis.

It’s a cruel certainty that, if left untreated, these polyps develop into cancer. Marcus says his goal is to one day develop a drug that will essentially turn off this genetic mutation and keep tumors from forming in the first place. Thanks to
scientific advancements, more families are aware of their genetic deficit and members undergo colonoscopies (examinations of the large intestine) beginning in their teens. Once the polyps take over the organ, patients have it removed and must wear a colostomy bag outside their body for their waste.

A drug that overrides this genetic defect would at most, save lives and at least, improve the quality of lives. “The surgical approach that they’re taking now is enormously better than early death but allowing people to keep their own colon and basically using a chemical treatment essentially as a prophylactic for cancer, to prevent it from forming in the first place, would be a real advance,” says Marcus.

On the front lines of this research, working hands-on with individual butterflies is fourth-year genetics student Amber Gemmell. Winning an Undergraduate Research Award meant she could spend the summer in Marcus’s lab doing experiments to improve our understanding of these shared genetics. “It’s just such a great experience to see what’s behind the closed door,” she says.

Called the wingless pathway in insects, these genes dictate the distance between a butterfly’s eye spots, which are the circular markings on their wings. Known as the Wnt pathway in the human colon, these genes are linked to its stretch function. A long tube that is constantly being scraped and scuffed, the colon routinely replaces its cells as a means to remain intact. It is the Wnt signal that tells the surrounding cells that it’s time to divide. A mutation in
this pathway means the cells aren’t given the follow-up instruction that it’s time to stop; the pathway never turns off. Eighty-five per cent of all familial colon cancers are due to mutations in one gene in this pathway.

Butterflies are an ideal candidate to measure how certain chemical compounds affect these particular genes since their wings are relatively simple: they’re only two-cells thick. And conveniently, they provide a visual readout of any changes made: their wing spots change size or colour.

Gemmell’s first task was to study the development of the wings by surgically applying chemicals to the part of the caterpillar’s body—the wing disc—that upon development into a butterfly forms the actual wing. She caught the butterflies, and their eggs hatched into caterpillars but a virus struck and kept wiping out entire colonies. Despite some creative troubleshooting, after a few experiments she eventually had to switch gears and tackle her investigations from a different angle.

“There are so many things that can go wrong, so many challenges, so many problems that you have to overcome. And it can be a very slow process but in the end when it actually does work, when you’ve gone through everything, it definitely is rewarding,” says Gemmell.

Encountering stumbling blocks gave her an authentic research experience, says Marcus, who likens science to baseball. “A really successful batter is hitting the ball one out of every three times. Most of the time the batter goes up to bat knowing that he or she is going to fail, and that’s the way a lot of science works actually. You make a lot of mistakes and there are a lot of things that happen that are entirely outside of your control. But the fact of the matter is you learn from all of those experiences.”

Gemmell’s revised direction had her using the DNA sequence of the genes to study the evolution of a particular butterfly group for two purposes: to better understand the mechanics of how the pathway works, and to uncover the groups’ evolutionary tree. This involved using a special microscope that activates fluorescent molecules and indicates exactly where the gene is expressed. She also had access to state-of-the-art equipment to remove, measure, and copy DNA. The sequence was then used to study the relationships between different species. “It was really exciting because you go to class and learn about all of these things but now I got the opportunity to apply these skills first-hand,” Gemmell says.

She also felt lucky to be working so closely with Marcus, who created the world’s first genetically modified butterfly as a postdoctoral fellow at the University of Buffalo in 2002. He joined the University of Manitoba seven years later as a Canada Research Chair in Phylogenomics (the study of the evolution of genes).

Marcus took a mobile genetic element called a transposon, and built inside of it a coding sequence for another gene, called green fluorescent protein. He injected this transposon into about 10,000 butterfly eggs, and once they became adults, looked for the green fluorescence in their eyes. He and his colleagues Diane Ramos and Antonia Monteiro produced six families of butterflies that carried this modified gene. “That was the proof of principle experiment that demonstrated that you could do this in butterflies. No one had ever done it before in a butterfly,” Marcus says.

Gemmell was thrilled to finally gain experience in her chosen field (last summer she was working in the insurance industry). A unit on genetic diseases—like cystic fibrosis and Huntington’s disease—in Grade 12 biology class first sparked her interest and set her on her path to one day becoming a genetic counselor. She knew she wanted to work with patients coping with genetic disorders even before she was diagnosed with her own. Gemmell has hemochromatosis, which means her body stores too much iron and if ignored can damage vital organs. The powerful role that genetics play intrigues her.

“To think that there is something so small that you can’t even see but that has so much control on who you are, something that can’t be seen with the naked eye but has so much impact on our lives. And there is so much unknown about it; there is something constantly being discovered in this field.”

Marcus is happy to have Gemmell contributing to the discoveries coming out of his lab. He too remembers when he became smitten with genetics. As a kid he loved keeping fish as pets and by the time he graduated from high school he had eight aquariums at home. Marcus would watch them grow from tiny larvae to adults and do his own experiments breeding different types of guppies to see what colours resulted. “It was sort of my early stages of practicing being a scientist,” he jokes, adding that he even kept records and still has them.

Marcus sees a similar enthusiasm in Gemmell, who during her research work got the chance to collaborate daily with his other research students, all of them working towards a common goal. She plans on continuing this research as an honour student this school year. “It’s been a huge learning experience,” Gemmell says, “from start to finish. And this learning experience isn’t going to end. There is continually something new to work on.”
CREATIVE WORKS

BY MARIANNE MAYS WIEBE
School of Art student Lisa Spiers (opposite page: far left) describes an image of a small, creaturely child curled up on a braided mat on the bathroom floor while her mother showers. Steam rises, the room is warm. The child was herself, says Spiers—and knowing that her mother was nearby as she lay curled on the floor, the softness and warmth of the neat concentric mat beneath her, and the humidity of the room all served to comfort her. The memory still epitomizes the security she was seeking as a child.

But what if she could carry that feeling of comfort and safety with her as she moved through a regular day? she thought. The idea for her unusual, wearable sculpture of braided pants was born. Working with textiles, she fashioned the pants that made their debut in Spiers’ sculpture studio, taught by artist and School of Art instructor Elizabeth Roy.

Fast-forward to Winter 2013, when Spiers did an undergraduate research placement with Roy. Before then, Spiers said, she couldn’t quite imagine what was entailed in the day-to-day work of being a full-time artist, or whether it was something that was really possible for her.

The opportunity to work with Roy in creating a project from start to finish gave the undergraduate fine arts student valuable insight both into the process of art-making and into the other activities involved in being an artist—from research to the procurement and use of unique art materials, and from shipping one’s artwork to meeting curators.

All summer, the two worked on Roy’s current project, entitled “Smashing Dishes.”

Oversized and non-functional, the plates in Roy’s “Smashing Dishes” series hang on walls and sit in stacks on the floor as installation pieces—and they are made entirely of felted wool.

Roy had a lot of help from Spiers in creating the plates, a time-consuming, labour-intensive process of felting wool over large foam moulds and then fashioning and attaching additional elements onto the felted forms. One of the plates took over a month of constant work by...
two artists. Roy says she knew her student would be a “perfect fit” for the project because of Spiers’ fine technical skills in drawing, attention to detail, and the fact that Spiers had used fabric and textiles in her own sculptural work.

Significantly, for Roy, the felt dishes are emblematic of a traditional divide between “craft” and what has customarily been seen as “fine art.”

Perhaps because of an association with the domestic spheres and clothing, textiles are generally underrated materials for art, says Roy. Additionally, textile arts are often pigeonholed as craft, a category in which more emphasis is placed on

Elizabeth Roy on “Smashing Dishes”:

The monochrome is an artistic marker for modernism, and links this work to contemporary artistic precedents such as Minimalism, Anti-Matter, De-materialization (the work of Robert Morris, Richard Serra, others) and feminist critique of gendered practices (Judy Chicago, Eva Hesse, others) or via its material to the social activism of Joseph Beuys.

The choice of figurative, landscape or abstract/decorative motifs refer to historical genres within art history since the Enlightenment, which is my rough chronology of interest. It is important to state that the randomness of inclusion is significant to the conceptual intent of the work (particularly as to the styles themselves, but also to the use of allegory or caricature) and to its eventual reception.

These investigations and processes result in the making of large-scale objects that resemble tableware. Each is based on a specific referent, yet in its artistic form, it is held back by the method of making. A shift in size and material pulls the audience into an uneasy relationship that disrupts expected responses. While clearly non-functional, through their dependence on unique and known form, these “plates” offer a variety of alternatives to normative histories, hierarchies and roles.
These dishes can’t be smashed, but they may chip away at some traditional ideas about art.

technique, decorative appreciation or function, and less on pure artistic interest. When Roy conceived the idea for “Smashing Dishes” about 10 years ago, she wasn’t sure about what materials to use but there were particular characteristics she knew she didn’t want the plates to have. The research process began.

Roy wanted the colour “to look like dust,” she said, so that the finished pieces would be devoid of the appeal that typifies decorative plates. The greyish raw wool she sourced from New Zealand is almost a non-colour, and was exactly what she required.

Felting also appealed to her, both because of its rarity as an artistic medium, and for its pliability and durability, a combination she needed for the size and intense detail in the designs. The dishes themselves are odd, both for their size and lack of colour and for their distinctly quirky motifs. Designs range from finely-textured, feathery landscapes of the sort one might associate with painting, to kitschy, unexpected figures that sit in the plates’ centres, very different from the standard subjects one might find on fine china or commercial ceramics.

These dishes can’t be smashed, but they may chip away at some traditional ideas about art. In refusing to render the plates in any way functional or decorative, and in making the artworks from a medium usually associated with craft, Roy intended to push at underlying values that separate art disciplines, including hierarchical distinctions within the arts.

FROM IDEA TO REALITY: RESEARCH AND ART

According to Roy, art is more than following creative impulses, pell-mell, and spilling them out onto a blank canvas. In fact, she says, this is a common misunderstanding about what art is.

It begins with the idea, says Roy. The idea is developed further, sometimes researched, and then conceptualized in a concrete way, often through trial and error — somewhat like scientific experimentation — discovering what particular materials will work for an idea, and how the idea can be realized.

Similar to Spiers’ pants project, “Smashing Dishes” had its genesis in a curiously mundane activity going back to Roy’s childhood: drying dishes. Being a visual person, she explains, “this was my first experience of looking at and thinking about patterns, landscapes, images on objects. And, of course, the differences in styles depended on where you were. Drying dishes at grandma’s house was a different experience than being at your sister’s place, for example.

“Certainly the creative impulse is part of the artistic process,” she asserts. “But it’s in addition to your research, drawing and writing, as well as the long-going interests that inform and are cultivated and developed through your art.

“That’s where the real work is done,” she finishes.
Critical Conversations on First Nations and the Right to Water

Two years after the United Nations recognized clean drinking water and sanitation as a human right, Manitoba researchers will lead public discussions on the most effective ways to make that a reality for First Nations.

Critical Conversations are held 2:30-4:00 p.m. in Room 206, Robson Hall, Fort Garry campus, University of Manitoba. **UPCOMING SESSIONS ARE:**

**FEBRUARY 4**

**TOXIC ORGANIC CHEMICALS IN THE ARCTIC**

Charles Wong (University of Winnipeg)

**TRACE METAL CONTAMINANTS IN NORTHERN COMMUNITIES**

Feiyue Wang (University of Manitoba)

**MARCH 4**

**THE ECONOMICS OF WATER AND SANITATION INFRASTRUCTURE PROVISION**

Melanie O’Gorman (University of Winnipeg)

**MARCH 11**

**ENGAGING THE YOUTH AND LEADERS OF TOMORROW IN WATER RIGHTS ISSUES: WHAT WORKS?**

Rob Penner (University College of the North) and Annemieke Farenhorst (University of Manitoba NSERC Chair in Women in Science and Engineering)

Critical Conversations is organized by the University of Manitoba’s Centre for Human Rights Research, with support from the NSERC Chair for Women in Science and Engineering in the Prairie region. It is open to all, free of charge. Course readings and podcasts are available online at chrr.info/resources/critical-conversations
BY THE NUMBERS:

- 71 endowed & sponsored research chairs – including 44 Canada Research Chairs and the highly competitive Canada Excellence Research Chair
- 53 research centres, institutes & shared research facilities
- 8 National Synergy Awards for Innovation
- 8,820 staff (2011/12) – 4,096 academic staff; 4,724 support staff
- 29,181 students – 24,996 undergraduate; 4,185 graduate
- 11.2 per cent of students are international, representing close to 104 countries
- $572.9 million annual operating budget (2012/13)
- $1.5 billion in building assets

RESEARCH FUNDS BY SOURCE 2011/12

- **TOTAL:** $159.2 million
  - **FEDERAL GOVERNMENT:** 45%
  - **PROVINCIAL GOVERNMENT:** 15%
  - **OTHER:** 40%

TRI-COUNCIL FUNDING 2011/12 ($ MILLION)

- CIHR (Canadian Institutes of Health Research) $16.7
- SSHRC (Social Sciences & Humanities Research Council of Canada) $3.9
- NSERC (Natural Sciences & Engineering Research Council of Canada) $15.1
Visit UMANITOBA.CA/VISIONARYCONVERSATIONS for more details on each event, including our complete list of panelists.

RSVP at visionary.conversations@ad.umanitoba.ca

UPCOMING VISIONARY CONVERSATIONS

WEDNESDAY, JANUARY 16
The New West: The Economic and Political Rise of Western Canada

WEDNESDAY, FEBRUARY 6
Crouching Tiger, Hidden Dragon: Does the Rise of China Mean the Decline of the West?

WEDNESDAY, MARCH 20
The Arts: Foundation of a Vibrant Community

WEDNESDAY, APRIL 17
Global Pandemic: Another Y2K or Future Apocalypse?

WEDNESDAY, MAY 22
Our Education System: The Good, the Bad, and the Solutions