The Civilian

One Department, Two Great Programs: Civil and Mineral Engineering / Issue 15 / June 2013

Surrounded by Revolution

Adam Koebel's leadership in the Libyan crisis

LeadingGREEN

How Lorne Mlotek's startup is helping engineers embrace LEED certification

welcome

Cover: CIV1T3 students Amanda Cirinna and Steven Goldstine recently won the 2013 Home Sweet Home Student Challenge with the design for Rick Mercer's retirement flat.

It is with great excitement that I prepare for working with faculty, staff, students, and alumni as the incoming 17th Chair of the Civil Engineering Department.

I would like to give sincere thanks to Brenda for her capable and inspiring leadership over the last five and a half years, continuing the legacy of the Chairs who came before in making this a great department and a great place to work and study.

The past 6 months have seen many exciting developments in the Department, as you will read in this issue of the Civilian.

I am particularly pleased to announce the arrival of two new professors. Professor Jeffery Siegel joins us from the University of Texas, working on building science and indoor air quality. Professor Jennifer Drake, joining us from the University of Guelph, is working on stormwater management and low impact development.

As the summer approaches, we are gearing up for Survey CAMP for our Civil and Mineral students entering third year. This year 111 Civil and 42 Mineral Engineering students will attend camp, one of our largest ever!

Our 26 Mineral Engineering students entering fourth year will be spending two weeks of their summer in the Sudbury area for the Geology Field Camp for Engineers.

Our incoming second year students will get their first experience at Camp as part of Introduction to Civil Engineering. I'm pleased to be leading this course as Chair. Similarly, the Mineral students will be going on a field trip to a mine this fall. It is all in an effort to help set the stage for their programs for the next 3 years and to give students a chance to get to know each other.

We are also anticipating the arrival of our new class of Civil and Mineral Engineers this fall, following a very enjoyable evening with aspiring future engineers and their parents at the annual Top Applicant Dinner.

I wish you all a great summer and look forward to working with you over the next five years. I would particularly like to encourage our alumni to call or visit to find out more about our latest research and teaching activities.

Brent Sleep

Brent Sleep
PhD, PEng

Professor & Incoming Chair
Department of Civil Engineering

Surrounded by Revolution

When **Adam Koebel (CIV0T3)** and his new wife Laura accepted an offer to work abroad, it wasn't something they took lightly.

The two had been debating the risks and benefits of leaving home, family, and the ease of their comfort zone for the chance to experience a new culture, take on a new adventure, and further their careers for two years by then.

It was no ordinary offer, either.

Tapped by Pure Technologies, a relatively new engineering firm with a unique way of monitoring the condition of prestressed concrete water mains, Adam was given the chance to bring his growing expertise in water systems to one of the driest places on Earth: the Sahara desert.

Overseeing the expansion of a large-scale public works project that would bring reliable water to the people of Libya was something that he could get behind, and better yet, he was good at it.

According to supervisors at Pure, Adam quickly made a significant contribution in recommending and implementing several process improvements that helped the company optimize pipeline repair schedules and budgets.

During Adam's time as Project Manager, his responsibilities included overseeing a team of local and imported engineers working at remote desert sites. During this period, the project expanded from five to nine expatriate engineers and over 30 local engineers and technicians. Over the same period, the monitoring program increased from nine sites monitoring about 400km of pipeline to 15 sites monitoring nearly 600km.

It was all going according to plan.

Adam and his wife had easily worked past the sixth month mark, a time he had been told was often the most difficult for overseas workers away from home for the first time.

The weather was reliably sunny and warm; the Benghazi seashore included a lovely path on which to run.

They made local friends and began to build a life. Laura, Adam's wife, even travelled north to Italy in pursuit of her own adventure.

When Mohamed Bouazizi set fire to himself and instigated the Tunisian uprising that saw President Zine al-Abidine Ben Ali flee to Saudi Arabia, nobody in Libya seemed to have too much to say about it. After 41 years of continuous rule, the name "Ghaddafi" was barely ever even uttered aloud in the streets.

But when Mubarak's Egypt fell in a populist revolt shortly thereafter, things began to change.

People got bold. They began to talk openly of the Libyan government's failures to solve a housing and infrastructure shortage. Small demonstrations began to crop up around the university.

Still, nobody predicted revolution. "Nothing seemed out of the ordinary," Adam writes of his first encounter with a soldier. "He waved back and I contin-

-ued on my way past."

It wasn't until several days later that Adam and his friends learned that 10000 people had marched in the streets of Benghazi that first night, and six had been killed.

The following days brought with them a strange duplicity. Smoke plumes over the city each morning intimated that tension had reached a boiling point, even as children kicked balls around in the streets and yards only blocks away.

The Internet had gone down, but the phones were still working. Adam fielded calls at the home of his friend, the Canadian Warden of Benghazi, detailing the destruction of the night before.

"It quickly became evident that panic was everywhere," Adam recalls. "The truth was mixed up in the chaos."

The Warden and his young family made the difficult decision to leave before things got any worse.

Driving to the airport, it became clear that rioters had been out in force only hours earlier. "I questioned whether I should have been on the plane myself," Adam recalls after seeing them off. "[But] there was no way I could leave my team behind."

Adam refocused on keeping the channels of communication open with diplomatic colleagues in Tripoli, who couldn't yet believe that much was amiss from their viewpoint in the loyalist capitol. Fighting intensified night by night, surrounding his once quiet suburban house with gunfire.

After helping several other Canadians move out of the most heavily affected areas of the city, Adam coordinated a move to a safe house at a farm just outside the city.

The airport had fallen into chaos, with two British planes unable to obtain clearance to evacuate.

Tripoli, meanwhile, was slowly slipping into its own state of panic, and the once confident Embassies there had too many problems of their own to be of any help this far East.

With war and looting creeping closer, Ghaddafi's actions growing more and more erratic, and the untrained farm staff hastily arming themselves, Adam managed to determine that his engineering staff were unharmed and holed up at their work camp.

"The biggest challenge was containing the rumours and instilling calm in people," Adam writes. "The foreign media continued to report stories of Libyan Armageddon." In fact, nothing could be further from the truth.

In the days after the fall of Benghazi to revolutionary forces, Adam saw countless acts of civic pride and citizen governance.

Anti-looting neighbourhood watches stood guard over homes and businesses. Young teenagers stood beneath shot out streetlights, directing traffic. People returned to the streets, eager to move on.

And move is exactly what Adam knew they needed to do. While Benghazi had fallen, the rest of Libya was descending into chaos and nobody knew what the government forces would do next.

Adam focused on working with the consulate on helping to coordinate an evacuation of several hundred people on board a British warship which had been diverted from anti-piracy manoeuvres.

A team of British commandos took Adam, his staff, and a load of other displaced foreign nationals aboard, unsure of how hostile the situation on the ground in Benghazi was going to be.

After an uncertain, sleepless week, they were finally safe. Adam and his staff joined 454 expatriates bound for Malta.

As the Libyan shoreline gradually slipped to the edge of the southern horizon, a sense of melancholy set in.

> “The biggest challenge was containing the rumours and instilling calm in people.”

Adam and his staff were safe. He would reunite with his wife in mere hours. "But it's my home," he recalls explaining to a passport staffer, "and I'm going to miss it."

Adam is the 2012-2013 Civil Engineering nominee for the Engineering Alumni Association's 7T6 Early-Career Award.

He still works for Pure Technologies, in the United States. He continues to be involved in Skule and is an 0T3 permanent class rep.

Adam’s casual but professional character epitomizes the way in which he gives back to the community.

He demonstrated exceptional leadership, compassion, and corporate social responsibility in his role as Acting Warden of Benghazi.

Lassonde Mineral Engineering Students Launch New CIM Student Chapter at U of T

On Friday, March 15th, students in the Lassonde Mineral Engineering Program hosted an event to mark the creation of the University of Toronto CIM Student Chapter.

Over 120 enthusiastic students from various programs at U of T attended the keynote lecture by David Harquail entitled "The State of the Gold Industry."

Several representatives from industry and the executive of CIM also attended alongside acting Dean, Prof. Yu-Ling Cheng and Prof. Russ Pysklywec, Chair, Department of Earth Sciences.

The CIM Student Chapter will further enhance the strong connections between the Lassonde Mineral Engineering Program at the University of Toronto with industry thought leaders, and will offer students an even greater chance to network with industry professionals in both business and academic settings.

The 2013 Executive of the U of T CIM Student Chapter alongside Mr. David Harquail, Mr. Jean Vavrek, Executive Director, CIM, and Prof. John Hadjigeorgiou, Director, Lassonde Mineral Engineering Program.

Pierre Lassonde Inducted into Canadian Mining Hall of Fame

Pierre Lassonde, a generous benefactor of mineral engineering at the University of Toronto, was inducted into the Canadian Mining Hall of Fame on January 11, 2013.

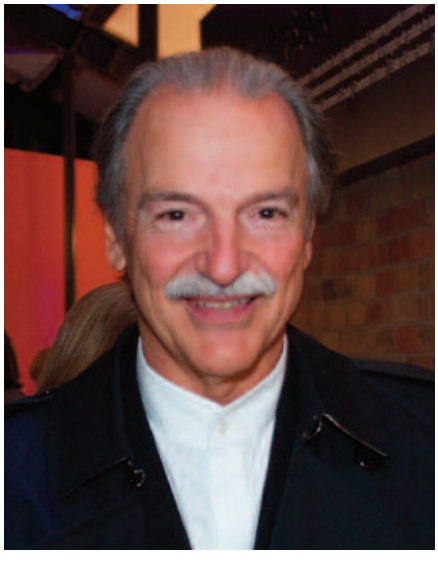
Philanthropist and talented businessman, Lassonde is recognized as one of Canada's foremost experts in the area of mining and precious metals.

His cumulative giving to the University exceeds $10 million, the largest contribution to mineral/mining engineering education in Canadian university history.

Both the Lassonde Institute of Mining and the Lassonde Mineral Engineering Program, as well as the Lassonde Mining Building now bear his name.

In 2001, he was granted an honourary degree by the University of Toronto. Lassonde has received many other awards, including the Order of Canada in 2002, Mining Man of the Year (1997) and Developer of the Year as well as other honourary doctorates in Canada and the USA.

"Pierre Lassonde has long been a friend and benefactor to Mineral Engineering at U of T," said Cristina Amon, Dean of the Faculty of Applied Science & Engineering. "I am delighted that he has been honoured in this way and I extend my heartiest congratulations to him and his family on behalf of U of T Engineering."



Dr. Pierre Lassonde
Photo by Engineering Strategic Communications

Holcim-UofT Sustainable Design Forum Brings Thought Leaders Together

Visitors to Toronto can be forgiven if they don't recognize parts of the skyline these days.

The city is now home to the most high-rise development in the Western Hemisphere, including 15 skyscrapers over 45 storeys, according to a recent Toronto Star report.

Couple that with what the Financial Post is predicting will be a prime time for low-rise family home renovation, and the opportunities for the advancement of smart building practice become clear.

How can we build better as we build up?

How can we conserve energy without sacrificing function?

The Department of Civil Engineering recently joined forces with the John H. Daniels Faculty of Architecture, Landscape and Design and Holcim Canada to address that very question.

More than 100 professionals from engineering, architecture, planning, development and academia joined us in the Sandford Fleming Building on April 30 to discuss the state of the art and the future of building envelopes.

The forum, "Sustainability, Durability Design: The Future of Building Envelopes," was moderated by Toronto Star architecture critic Christopher Hume and featured a keynote by Kevin Hydes, past chair of the World Green Building Council.

The event was the first in what is planned as a series of forums on sustainable development.

Discussion centred on how urbanization is driving development and how to address efficiency needs in both new construction and existing stocks of older buildings.

"U of T is delighted to partner with Holcim Canada on this initiative," said Professor Brenda McCabe, Chair of Civil Engineering. "Because of Civil Engineering's strong focus on urban sustainability, being part of the hosting team was a fabulous opportunity to demonstrate how industry and academia can collaborate to achieve great things. We look forward to working with the forum participants to take steps toward improving our building infrastructure."

"We are incredibly pleased with the success of our first forum. We brought together thought leaders who can bring to the table the real issues we are facing in developing Canada's sustainable infrastructure and work together, across disciplines, to tackle these issues and make tangible progress. From a building material producer and supplier perspective, Holcim Canada aims to take a leadership approach and to be a part of this discussion to explore solutions and innovations for our changing needs to provide sustainable and resilient infrastructure," said Nick Caccavella, Senior Vice President, Holcim (Canada) Inc.

U of T and Holcim plan to develop a white paper from the day's discussions and organize a similar forum this fall to explore some of the more detailed topics that were explored in the first forum.

Toronto Can Reduce Greenhouse Gas Emissions by 70%, Research Shows

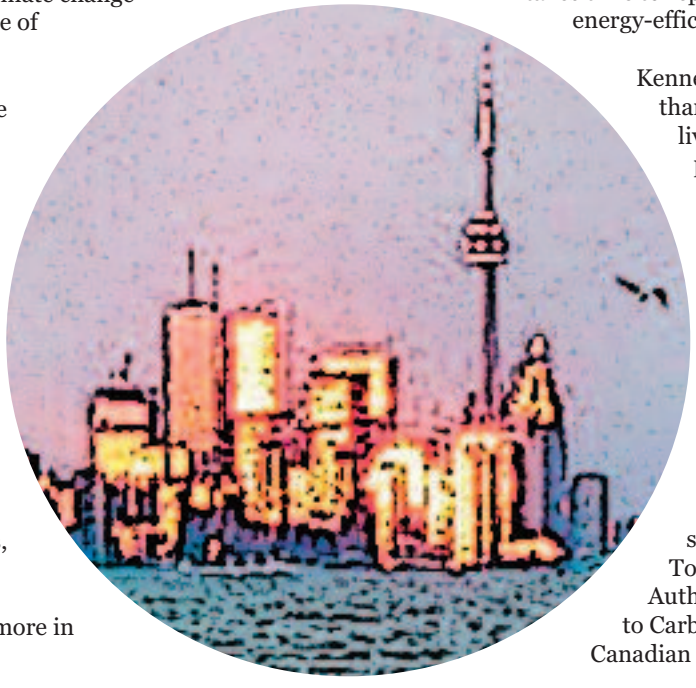
Story by Terry Lavender

Toronto – and other cities around the world – can significantly reduce greenhouse gas emissions by implementing aggressive but practical policy changes, says a new study by Civil Engineering Professor Chris Kennedy and World Bank climate change specialist Lorraine Sugar, one of Kennedy's former students.

Kennedy and Sugar make the claim in, "A low carbon infrastructure plan for Toronto, Canada," published in the latest issue of The Canadian Journal of Civil Engineering.

The paper aims to show how cities can make a positive difference using realistic, achievable steps.

Their research shows it is technically possible for cities, in Canada and beyond, to reduce their greenhouse gas emissions by 70 per cent or more in the long-term.



"This is the sort of reduction the international community is calling for, so we can avoid the potentially serious consequences of climate change," said Kennedy.

The study focuses on buildings, energy supply and transportation. Best practices as well as options and opportunities – for example, encouraging electric cars and increasing bicycling infrastructure – are detailed.

"With current policies, especially cleaning of the electricity grid, Toronto's per-capita greenhouse gas emissions could be reduced by 30 per cent over the next 20 years. To go further, however, reducing emissions in the order of 70 per cent, would require significant retrofitting of the building stock, utilization of renewable heating and cooling systems, and the complete proliferation of electric, or other low carbon, automobiles."

The biggest obstacle is the city's building stock, according to Kennedy.

Buildings have a lifespan measured in decades, so it takes time to replace older buildings with more energy-efficient ones.

Kennedy and Sugar note that more than half of the world's population lives in urban areas and over 70 per cent of global greenhouse gas emissions can be attributed to cities.

"Cities are where people live, where economic activity flourishes," said Sugar. "Cities are where local actions can have global impact."

The study arose out of a handbook Kennedy and his students produced for the Toronto and Region Conservation Authority in 2010 entitled, Getting to Carbon Neutral: A Guide for Canadian Municipalities.

In the current paper, Kennedy says he and Sugar wanted to demonstrate how cities could achieve measurable results by adopting the policies outlined in the guide.

Kennedy, author of The Evolution of Great World Cities: Urban Wealth and Economic Growth, teaches a course on the design of infrastructure for sustainable cities.

He has consulted for the World Bank, the United Nations and the OECD on urban environment issues.

This year he will help coordinate the Master of Engneering in Cities Engineering and Management, a new, 16-month opportunity in the MEng program designed to build technical expertise and a fundamental understanding of the complex and cross-disciplinary issues facing cities all over the world.

Low-Impact Development: The Challenges and Benefits

We are thrilled to welcome Professor Jennifer Drake, who joined us earlier this spring from the University of Guelph.

Prof. Jennifer Drake

Tell us about your research.

My research focuses on low-impact development and the challenges associated with implementing it.

We look to identify barriers to low-impact development and then develop solutions that are economically practical and culturally acceptable given a place's local climate, geology and land use.

Low-impact development is a design and planning method that seeks to reduce the impact of our urban centres on our natural water resources, and we achieve this by developing stormwater management systems that better mimic natural flow paths and conditions.

What motivates you in your research?

Poor stormwater management leads to all kinds of problems, like increased risk of flooding, erosion, degradation or depletion of drinking water and loss of aquatic ecosystems.

The challenges associated with protecting our water resources and managing them in a more sustainable fashion is something I find fascinating.

I hope as an educator here I can help the next generation of women engineers pursue engineering, stay in engineering, and perhaps choose research as a career path.

What attracted you to U of T Engineering?

There were two major things that stood out that attracted me to the University of Toronto.

The first was the chance to live and work here in the City of Toronto. Toronto is one of the most diverse and liveable cities in Canada (if not the world).

The second was that I knew this would be a great place to start a research program. I saw a lot of opportunities where my research interests complemented or could be incorporated into programs that already existed here, like the environmental engineering research group, the Cities Centre, and the Centre for the Resilience of Critical Infrastructure.

In Toronto we are quite close to two of the most active conservation authorities: the Toronto Region and the Credit Valley.

Both are really leading the way in implementing integrated water management.

Indoor Air Quality Expert Jeff Siegel Joins U of T

Professor Jeffrey Siegel has joined the department of Civil Engineering in a new and exciting role: studying the air we breathe.

Prof. Jeffrey Siegel

Tell us about your research.

I study mostly the indoor environment. I'm interested in the things we're exposed to inside of buildings.

For example, Canadians spend about 90% of their time inside buildings, and many of the things that we breathe inside buildings have the potential to be harmful.

I try to understand these things.

What motivates you in your research?

Several things: one is that if effects all of us.

The other thing is that it is a very interesting field scientifically. It draws on civil engineering, biomedical engineering, mechanical engineering, etc.

It is a diverse bunch of things to study. I also think that as we move towards more sustainable indoor environments from an energy perspective we sometimes neglect the indoor environmental health aspects of a building, so I'm interested improving those.

Right now Canada has many very good academics who study indoor air quality but there is no central focus. I hope that within a decade we can make University of Toronto a centre of the study of the indoor environment.

I want to create awareness about the field, to motivate and interest students who are going to go on and become leaders in the field in the future.

What attracted you to U of T Engineering?

There were several things that attracted me to U of T Engineering, but one thing is certainly the quality of faculty

Here in my research area, indoor air quality and indoor environmental engineering, there are many people across the University who are doing good research in the area.

When did you know you wanted to be an engineer?

I think like many people I was good in math and science, interested in practical applications of things, and so I just fell into engineering. But I think that the part of our story that doesn't get told as often is that I also wanted to make a difference.

I think that a lot of people think of things like the health professions as the classic example of a career that makes a difference, but engineers also make a difference.

It became very clear that engineering would be a good way to make a difference.

1st Place Team in Home Sweet Home Student Challenge

100 MENG STUDENTS

Murray Grabinsky Appointed Robert M. Smith Chair in Geotechnical Mine Design and Analysis

Khandker Nurul Habib received the "Minister's Award of Excellence in Process Innovation" from Alberta Ministry of Transportation

Paul Young awarded Queen Elizabeth II Diamond Jubilee Medal

Top 3 in 9 Events at Canadian Mining Games

134 MIN STUDENTS

8 ENGINEERING HALL OF DISTINCTION INDUCTEES

Civil

37 PROFESSORS

Kamran Esmaeili Receives Connaught New Researcher Award

Congratulations to David Johnson, an alumnus and current PhD Candidate. He received the highest teaching evaluation score for a core undergrad course this fall.

Shamim Sheikh elected as Fellow to the Engineering Institute of Canada.

2 7T6 ALUMNI EARLY CAREER AWARDS

213kg PRODUCE HARVESTED FROM OUR GREEN ROOF

Paul Young awarded Queen Elizabeth II Diamond Jubilee Medal

Doug Hooton Elected Fellow of Canadian Academy of Engineering

1st Ranked Engineering School in Canada

84 MASC STUDENTS

2 Top 10 Teams in Home Sweet Home Student Challenge

Eric Miller receives the inaugural Margolese National Design for Living Prize at UBC

Prof. Baher Abdulhai and his research on "intelligent" traffic lights that can learn from traffic patterns was featured in this weekend's Globe and Mail.

CSCE CIV/MIN Career Fair a Huge Success

Mineral

6978 CONTACTABLE ALUMNI

3 MALCOLM MCGRATH ALUMNI AWARDS

1 ENGINEERING ALUMNI MEDAL

Chris Kennedy is President-elect of the International Society for Industrial Ecology

Shamim Sheikh elected as Fellow to the Engineering Institute of Canada.

NEW MENG IN CITIES ENGINEERING AND MANAGEMENT

To support all of these industry connections, the LME students are launching a CIM (Canadian Institute of Mining, Metallurgy and Petroleum) Student Chapter. Kristin Foster and Sebastien Balda have done an outstanding job of creating this new Chapter.

Engineering

83 PhD STUDENTS

5 2T5 ALUMNI MID CAREER AWARDS

CSCE CIV/MIN Career Fair a Huge Success SWAAC Recognition Award

Paul Young awarded Queen Elizabeth II Diamond Jubilee Medal

Kamran Esmaeili Receives Connaught New Researcher Award

559 CIV STUDENTS

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1st Ranked Engineering School in Canada

Take Our Daughters and Sons to Work Day at U of T

The University of Toronto's Take Our Daughters and Sons to Work Day took place on April 25 this year, welcoming hundreds of our staff and faculty's children from Grades 4-7.

The day included a welcome from Cheryl Misak, Vice-President and Provost, and a special kid-friendly mini lecture on how the Internet really works from Prof. Karen Reid.

The Department of Civil Engineering also took part in the event, offering tours and job shadowing to kids from a variety of different backgrounds.

Simone Larcher and **Pulin Mondal**, two Post-doctoral Research Fellows working in our Groundwater Research Group, hosted tours of our teaching and research labs.

"It was exciting for us to share our research with the students and introduce them to the idea that civil engineering encompasses environmental issues such as groundwater contamination and remediation," Simone said. "I hope that after spending the morning with us they will see the world a little differently and be more aware of the relationship of groundwater to rivers and lakes and its importance in the overall hydrologic cycle."

Civil Engineering was one of 15 departments participating in this year's activities.

Other activities included building workable cityscapes with architects, touring the planetarium and viewing live sunspots through telescopes, examining fossils, and blowing stuff up (and then explaining why) in the chemistry labs.

Students even got to try on convocation regalia, marking, perhaps, the fastest time to "degree" completion that we've seen yet.

Pulin Mondal and a student interact with experiments that highlight the importance of groundwater.

Simone Larcher shows students where groundwater comes from and how to protect it.

Sandy Tang Wins ORBA Award in Civil Engineering

Ever since her parents introduced Sandy Tang to the world of mathematics at the age of five, she has been drawn to puzzles and professions that require a keen analytical mind.

Her passion for numbers combined with her affinity for physics have helped Tang achieve great success throughout high school and earned her a spot in the Civil Engineering program.

"I hope that in the coming years, I will be able to offer my creativity and problem-solving skills that I have developed at University of Toronto to help improve our society," says Tang.

In addition to her academic success at Westlane Secondary School, Tang has also demonstrated leadership through many high-school initiatives.

She was integral in planning and delivering multiple school presentations and assemblies for young men and women dealing with self-esteem, mental health and discrimination, and has been a regular participant in student art shows and a designer for her high school's Robotic Team.

"Sandy is a dedicated student in academics and leadership aspects at school," noted Carol Purcer, Principal of Westlane Secondary School in her reference letter for Sandy. "Sandy persistently seeks to make the world a better place in both her initiatives and the way she lives her life."

Outside of school, Tang is a student of the Ontario Conservatory of Music, an active member of the Niagara Falls arts community, and a youth representative with the Niagara Region Youth Advisory Committee.

Looking ahead, she is excited to be attending U of T and thanks ORBA for helping her forward her career.

"I was very happy and overwhelmed when I received a call explaining that I had been selected as the recipient of this scholarship," says Tang. "I would like to thank ORBA for providing this scholarship because it has helped with my expenses towards school. I am very grateful for this."

Prof. Paul Young Wins Queen Elizabeth II Diamond Jubilee Medal

By the end of this year, 60,000 Canadians will have received a Queen Elizabeth II Diamond Jubilee Medal in recognition of their contributions to Canada.

The medal was established to commemorate the 60th anniversary of Her Majesty's accession to the throne, and among this esteemed group of recipients are several members of U of T Engineering, including our own Prof. Paul Young.

Over the last 25 years, Professor Young has been a global leader in the fields of rock mechanics and geophysics, significantly advancing the understanding of fundamental mechanics of fracturing in brittle materials, induced seismicity, micromechanical modelling and geophysical imaging.

His contributions to engineering sciences have had international applications in mining, underground disposal of radioactive waste and petroleum engineering.

Professor Young served as President of the British Geophysical Association from 1999-2003.

In 2005, he received the John A. Franklin Award from the Canadian Geotechnical Society, given to outstanding researchers who have made significant contributions to the field of rock engineering.

Prof. Paul Young
Professor and
Vice-President, Research

Prof. Esmaeili Wins Connaught New Researcher Award

Prof. Kamran Esmaeili's academic journey is driving full speed ahead thanks in part to his success in this year's Connaught New Researcher Awards.

Prof. Kamran Esmaeili

The program is designed to foster excellence in research and innovation among researchers at the assistant professor level who are within the first five years of their first academic appointment.

"One of the goals of the New Researcher Award," said Professor Paul Young, U of T's vice-president (research and innovation), "is to help new professors establish strong research programs, which in turn makes them more competitive for external funding."

Prof. Esmaeili won for his research into the characterization of impact-induced damage of rock masses in ore pass systems.

The award is part of a suite of programs administered by the Connaught Fund, and is rooted in the Connaught Fund philosophy of investing internally in U of T research.

Created from the 1972 sale of Connaught Laboratories, which first mass-produced insulin, the Nobel award-winning discovery of U of T researchers Frederick Banting, Charles Best, J.J.R. Macleod and James Collip, the fund invests close to $4 million annually in emerging and established scholars.

"The Connaught New Researchers are part of a legacy of research excellence at the University of Toronto," said Young. "Congratulations to them on these well-deserved awards. I look forward to seeing the results of their research in coming years."

Prof. Evan Bentz Wins Faculty Teaching Award

Prof. Evan Bentz

Prof. Evan Bentz has been named the recipient of the 2013 Faculty Teaching Award from the Faculty of Applied Science and Engineering.

His excitement about learning is matched only by his extraordinary understanding of the material and the magic that he uncovers for those seeing it for the first time.

Evan's teaching record is truly outstanding, as evidenced not only by some perfect 7 teaching evaluation scores but also by the letters from students.

Home Sweet Home: U of T Student Team Takes Top Prize at Green Building Design Challenge

Amanda Cirinna and Steven Goldstine (both CIV1T3) recently took top honours at the Home Sweet Home Student Challenge, an annual Ontario-wide green building design competition developed by OntarioGreenSpec.ca and vied for by schools across the province.

The competition, which is adjudicated by an advisory board of twelve academic leaders and green building practitioners, was created to engage Ontario's post-secondary students in the research, innovation, and adoption of green building techniques.

Schools were given a specific scenario for a project to take on and given several months to come up with a comprehensive proposal that was presented to the board.

This year's challenge? To design a modest retirement residence for comedian and noted environmentalist Rick Mercer.

The house is to be conveniently located within the specified triangular boundaries of the back lawn of 24 Sussex Drive in Ottawa, the official residence of the Prime Minister.

The design constraints specified that the home needed to exemplify out-standing energy-efficiency, water-effi-ciency, and social and environmental responsibility, with a focus on made-in-Ontario materials whenever possible.

It required two sleeping spaces, a kitchen, bathroom, and work or living area and needed to be entirely above-grade.

It needed to be stylish.

But perhaps most importantly, it needed to exhibit affordable, adoptable technologies that could be repeated by Ontario's building sector, giving the home a real impact on construction projects happening right now all around us.

The team estimated the dimensions of the parcel of land using some specifications and a Google map provided, and went to work.

The triangular area was bounded by a row of coniferous and deciduous trees on the southwest, deciduous trees and a steep decline to the Ottawa River on the northwest and fairly open space up to the existing residences on the east.

The terrain was shown to be flat and room for a driveway to connect to the existing right of way was available to the southeast.

"Many factors influenced the physical design of our home," the team wrote in their submission to the committee. "Although the primary objective of the design was to be as sustainable and efficient as possible, we balanced this with other considerations such as liveability, aesthetic appeal, practicality, and optimal use of land. We wanted to allow for as much natural light to flood the interior as possible and take advantage of the spectacular view from the property, but were cognisant of the window-to-wall ratio as to not jeopardize the thermal integrity of the building envelope."

A careful balance of openness and privacy in the interior layout was considered. "We attempted to achieve the maximum volume-to-surface area ratio possible while working with the given site layout and features of the surrounding environment. In the end, the final layout exhibits a well thought out balance between all design objectives while adhering to the constraints outlined in the challenge scenario.

In the end, they settled on a one-and-a-half storey house which covered a rectangular footprint of only 32.3' by 22.3'. The partial second storey covers a smaller footprint, and is trapezoidal in shape.

But it's defining feature is the offset, south-facing window wall on the second storey which leads to an open, 17' high interior atrium.

"This was designed to provide lots of natural light to both floors as well as give a feeling of openness in what is a rather small space," they write.

The design will accommodate passive solar heat gains during the colder months, of which there are no shortage in Ottawa.

Amanda and Steven competed in the contest as part of their final year capstone design project, a major undertaking designed to bring together all the fundamentals they had learned over four years in one culminating, practical experience.

The project was undertaken with the guidance of **Prof. Kim Pressnail** and numerous other experts who provided key advice.

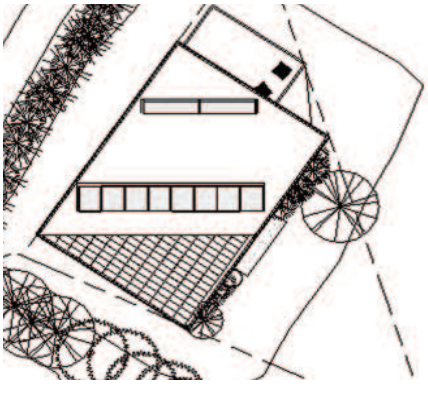
Lee Hamu (CIV1T3), a fellow student in the capstone course, also provided HOT2000 energy modelling during the course portion.

"It was a lot of work," Amanda reflects, "but it was exciting knowing the design was done with Rick Mercer in mind."

Looking to move in yet? You may have to take a place in line given the attention this project has garnered.

Amanda Cirinna and Steven Goldstine with their poster for the "Building it Bright" Eco-House.

Exterior detail showing green roof and window on second level.



Site plan showing building footprint and planned landscaping.

Interior detail showing living space and light from towering atrium.

Defining Your Sustainability: LEADING GREEN

By Lorne Mlotek (CIV1T3)

Sustainability seems to be the buzz word of our century. If properly employed, its impact can be felt in every design decision for the built environment.

But is the word overused?

Engineers often ask ourselves the question, "What is a sustainable building?" A number of different organizations have tried to define just how a building can provide for the current population without compromising the ability future generations to provide for themselves.

The foremost sustainability rating is provided by Leadership in Energy and Environmental Design (LEED), a system of benchmarks developed by the U.S. Green Building Council and recognized worldwide.

LEED is simply a third party green rating system, a scorecard to judge the sustainability of a building. The building's efficiency and the extent of its environmental and social impact is used to determine the amount of points and subsequent award level it achieves.

The LEED points awarded are based on things like site impact, water usage, energy consumption, type of material and the building's indoor environmental quality.

While buildings can be LEED certified, people in the sustainable construction industry can become LEED Professionals.

The first tier of LEED accreditation is the LEED Green Associate (GA) which is a great way to enter any green industry and show employers or clients that you are environmentally conscious and knowledgeable.

Over the past two years students and alumni have responded to the industry's demand for sustainability-minded professionals.

After writing my LEED Accredited Professional (AP BD+C) exam in 2010, I began tutoring students and professionals through a group named LeadingGreen.

The course is offered at a fraction of competitor's pricing and has helped over 700 people take their LEED Training course and pass their LEED Green Associate exam.

Over the summer I will be continuing to teach LEED exam preparation courses for the Green Associate and the Accredited Professional.

Sustainability is here to stay, especially in our industry, and LEED is helping pave the way for greener building standards and professionals.

For more information about LEED and upcoming courses please visit www.LeadingGreen.ca or e-mail me at info@leadinggreen.ca.

Lorne Mlotek (CIV1T3)

Course are designed to be completed by working engineers, students, and everyone else with an interest in sustainable design with convenient scheduling over weekends and online on our website.

Lorne has probably been the single most influential undergraduate student in the Department of Civil Engineering in his year.

In addition to starting his company, LeadingGreen, Lorne founded and runs the student group Engineers in Borders.

Engineers in Borders focuses the principles of Engineers Without Borders on the localized community around campus: they helped the Toronto District School Board acquire more math and science tutors, participated in the Great Canadian Shoreline Cleanup, coordinated food drives, and more. Lorne fundraises, communicates, budgets, and helps lead this organization.

Through LeadingGreen, Lorne has overseen the development of a full preparation course with approximately 16 hours of instructional time.

Mining Games Team Sees Spectacular Results

The Lassonde Mineral Engineering student team from the University of Toronto, 2013.

The Lassonde Mineral Engineering Program students had a spectacular showing at this year's Canadian Mining Games, placing in the top 3 in a total of 9 events.

The team placed second in Equipment Selection and Mineral Economics categories and took third place in seven others including the Stock Market Challenge, Environment, Health and Safety, Jackleg Operation, the Exam Package, Mechanical Design, and a Mystery Event chosen each year by the hosting team.

At the end of the day, this all amounted to a seventh place finish overall, and an improvement of seven top-3 finishes, over their two top-3 finishes last year.

"We cannot begin to say how proud we are of our team," Lassonde Mineral Engineering student leaders **Nicolas Scarcelli-Casciola** and **Sebastien Balda** said in a press release, "and how much we look forward to hearing about the next team's further improvement."

Without the generous donations from sponsors, the team's visit to the games would likely not have been possible.

Sponsorship funds covered the means of transportation, the costs of banners, and team attire.

Each year the Canadian Mining Games allow students to network with their peers and other members of industry from across Canada and around the world, while also giving them the opportunity to display their mining and designing prowess in front of the mining industry's elite.

Concrete Guitar Wins Silver Medal Prize

Alireza Dehghan's winning entry, a concrete guitar carefully modeled after a classic Fender Stratocaster.

Prof. Karl Peterson and PhD student **Alireza Dehghan** spend their time analyzing concrete and other building materials on the small scale - the really small scale.

But the microscopy experts recently made a big splash at the American Concrete Institute Spring Convention in Minneapolis, showing off their concrete guitar modeled with fine detail after a classic Fender Stratocaster.

The guitar took Second Place in the Art of Concrete Student Competition, which is sponsored each year by the ACI Minnesota Chapter.

The competition aims to explore the artistic nature of concrete and display its many varieties of form, function, and beauty.

Weighing in at a solid 20lbs, the guitar could prove to be a challenge to play even for a seasoned musician.

Brenda McCabe Wins SWAAC Award for Educational Leadership

Prof. Brenda McCabe, Chair of the Department of Civil Engineering, has been selected to receive the 2013 SWAAC Recognition Award from the Senior Women Academic Administrators of Canada. This award is given to a SWAAC member who has continually demonstrated innovative leadership in advancing the mission of, and achieving outstanding contributions to, her institution.

Professor McCabe joined the Faculty in 1997 and was appointed Vice-Dean, Graduate Studies in 2006 – the first female Vice-Dean in the Faculty. In that role, she championed a new series of courses that brought professional and management learning to our MEng program.

Professor McCabe approaches her position as a role model for female students and professors with dedication and responsibility. For example, she recently initiated the creation of five new scholarships acknowledging the first five women to graduate from Civil.

Her efforts are successfully increasing the participation of women in a field which has traditionally not been gender balanced.

Centre for the Resilience of Critical Infrastructure Takes Research to Israel

Even in the middle of the desert our researchers are active, flying the flag for Civil Engineering!

Prof. Jeff Packer recently joined a contingent of researchers from the Centre for the Resilience of Critical Infrastructure at the University of Toronto and partners Explora Security Ltd. and the Explora Foundation to study the effect of blast forces on structural elements.

These large-scale tests, conducted in the Israeili desert, are allowing engineers to develop the next generation of resilient structures protected from the effects of energetic loads.

Current University of Toronto projects deal with innovative wall panel connectors for the mitigation of blast loading effects, the performance of glass façades and verification of glass failure prediction models under blast loading, and behaviour and design of steel hollow structural section members under blast loading.

Prof. Khandker Habib Wins for Excellence in Transportation Innovation

Prof. Khandker Habib was recently honoured by the Government of Alberta with a 2013 Alberta Minister's Award of Excellence in Transportation Innovation.

The award was presented to the team members working on a strategic project through Clifton Associates and commissioned by the Alberta Economic Development Authority (AEDA) titled "Congestion Management Strategies for Infrastructure Planning in Alberta."

The project developed a congestion management (CM) strategic framework for Alberta. The report delineates a three-staged approach (Reduced Traffic Demand - Least Cost, Manage Traffic Demand - Most Cost, and Increase Infrastructure Supply - Most Cost) in four geographic congestion areas (Central Business Districts, Inner-City Networks, Major Corridors, and Accelerated Growth Regions).

In this approach, Alberta can proactively address traffic congestion before the issues become major impediments to economic development, productivity, and quality of life.

The resulting solution provides the framework for implementing new innovative CM technologies that have strong potential to deliver the same transportation results at a fraction of the cost of some conventional infrastructure upgrades. This economic return on investment (ROI) is instrumental in sustaining the infrastructure system, supporting strong growth in the construction industry, and supporting other essential programs and services.

In essence, this approach views transportation as a business investment as opposed to a program expense; where the appropriate direction of transportation spending can realize strong net economic return benefiting industry and people alike.

The awards were presented at an awards ceremony earlier this year.

Prof. Jeff Packer setting up for large scale field blast testing in the Israeli desert.

Prof. Shamim Sheikh Appointed EIC Fellow

Prof. Shamim Sheikh has been named a Fellow of the Engineering Institute of Canada (EIC) for his outstanding engineering achievements.

Professor Sheikh has developed new materials, new procedures for the design of concrete structures under extreme loads, innovative techniques for the life extension of structures and has applied his research in the development of sustainable infrastructure.

Professor Sheikh has a distinguished record of service and leadership on technical committees for professional societies in Canada and the U.S.

He also serves as a consultant to the United Nations, oil companies such as Petro-Canada and Shell, and engineering companies around the world.

Survey Camp Gets a New Pontoon Boat This Summer

As the curriculum at Survey Camp continues to evolve so does our capacity to help students learn.

We have invested in a flat-surface pontoon boat to help students without canoe experience better handle Gull Lake and complete unique field survey and water ecology assignments from its beautiful surface.

Students will undertake to measure things like the oxygen levels of the lake at various depths in order to better understand the impacts that we as humans have on the natural environment.

See the back cover for more information on this year's Survey Camp Reunion, and learn more first hand.

Coming Events

Seventh Annual CAMP Reunion

Saturday, September 14th 2013

Gull Lake CAMP, Minden
11:00 a.m. Reception and Lunch

Optional Bus Available from Toronto
(while space permits)

Ticket sales and registration:
www.civil.engineering.utoronto.ca/alumni

CIV-GEO-MIN Alumni Dinner 2014

Friday, February 7th 2014

Toronto, Ontario
6:30 p.m. Reception, 7:40 p.m. Dinner

Ticket sales and registration:
www.civil.engineering.utoronto.ca/alumni

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