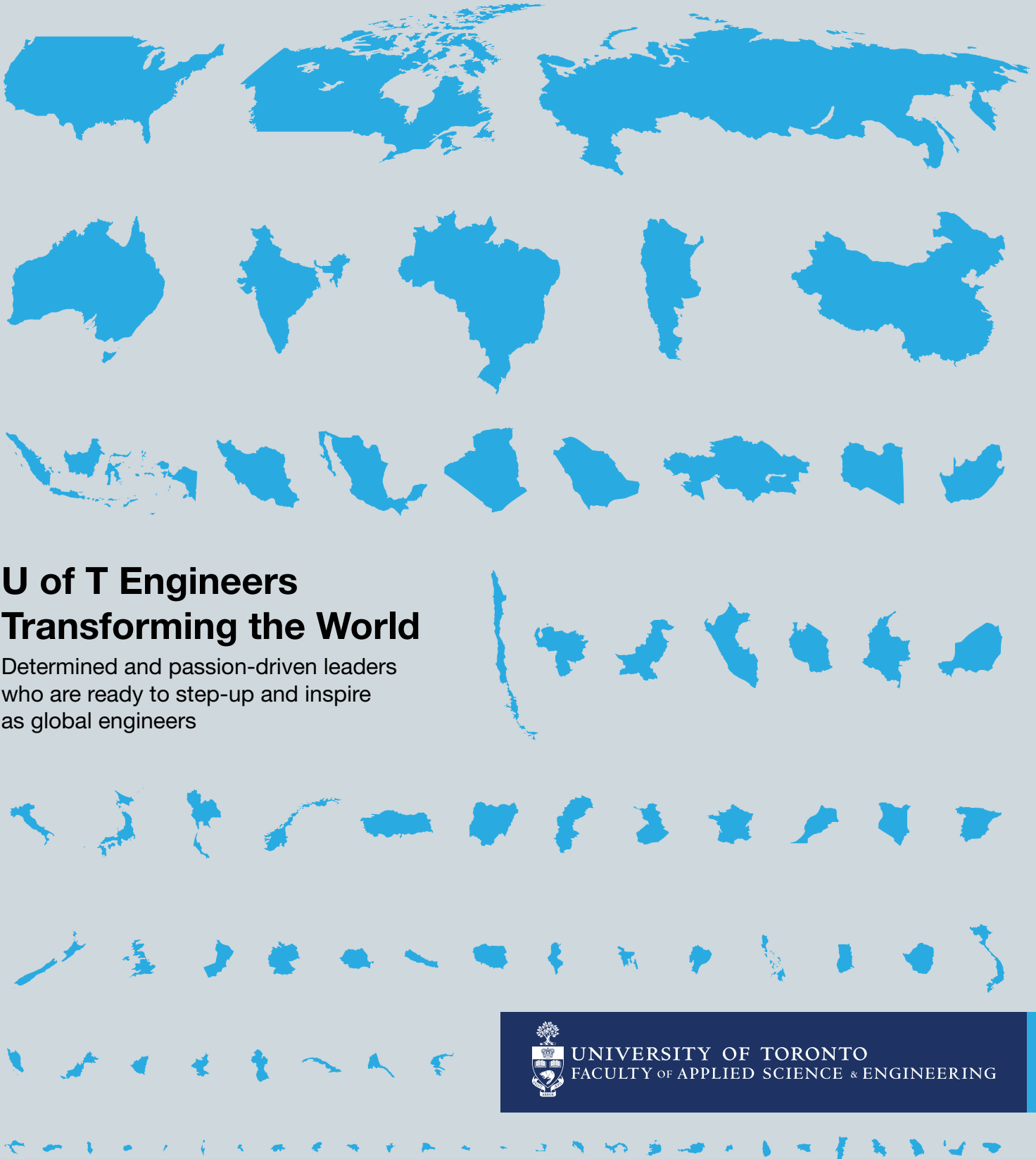


Skulematters

Faculty of Applied Science and Engineering / **Globalization** / 2009



U of T Engineers Transforming the World

Determined and passion-driven leaders
who are ready to step-up and inspire
as global engineers



UNIVERSITY OF TORONTO
FACULTY OF APPLIED SCIENCE & ENGINEERING

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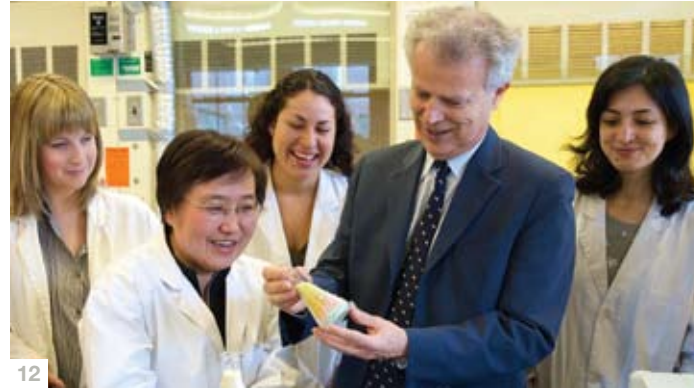
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Skule™ Leadership Globalized

Our role as engineers is fundamental in advancing human development and technological innovation. The increased globalization of society is linking people and economies across geographic space and time in ways we have never been linked before. In the face of the new realities of our world, we are developing an educational paradigm that prepares engineers to work across cultures and disciplines in an unprecedented collaborative manner.

With a depth of research and international perspective, we are uniquely able to nurture a new generation of engineers — technically strong and globally astute — to address some of the most pressing and complex issues of our time. It is no surprise our distinguished Faculty continues to be the premier Engineering program in Canada one of the leading Engineering institutions worldwide, now ranked tenth in the world.*

Our Faculty is defined by the unifying theme of the global engineer, who works competitively and collaboratively to improve the world's living conditions and for the creation of wealth and technological prosperity. This issue of *Skulematters* highlights how some of our alumni, faculty and students who are cultivating leadership and responsibility in a global context.

Situated in the city of Toronto, we continue to develop awareness of international

issues required of the global engineer and to celebrate our multicultural richness. Building on our geographical advantage, this fall we will introduce two new minor programs in **Sustainable Energy** and in **Environmental Engineering** and we are also developing minors in **Globalization** and in **Engineering and Public Policy**. Our educational initiatives are complemented with our co- and extra-curricular programs, such as Engineering Leaders of Tomorrow, Professional Experience Year Internship, and U of T Chapter of Engineers Without Borders.

Another unique advantage in educating global engineers at U of T Engineering is the role models provided by our alumni and faculty — some of whom are profiled in this issue. We are pleased to highlight some of the international research collaborations among our faculty, in addition to the leadership of highly accomplished global graduates who position Ontario and Canada at the forefront of the competitive market place.

These advantages are well matched by the enthusiasm and drive of our students, as they work together to learn and experience more about the world around us. Our commitment to addressing global challenges has given our students a greater international appreciation and perspective, and has led to recognized leadership and global community outreach efforts — some of which are highlighted in this issue. Given the rigor and demands of our



Engineering curriculum, their level of engagement is all the more significant.

We continue to build on these strengths as we develop our globalization theme. The recent appointment of Murray Metcalfe as Professor, Globalization and the consolidation of our globalization activity in the new Centre for Global Engineering (CGEN) focus and invigorate our efforts. We are a Faculty with a population representing many world countries and we value the richness of a diverse community and the contributions made by a wide variety of people, including yourself.

The resources of our vibrant alumni and internationally renowned faculty continue to be invaluable to advancing the innovation agenda of our country in our collaborative globalization goals. It is my hope that you take pride in the way Skule™ is fulfilling our global leadership responsibilities. There is much to celebrate and much still to accomplish.

Cristina Amon
Dean

* 2008 Times Higher Education – QS; 2008 U.S. News & World Report World University Rankings.

Moving Forward: Global Style

STORY BY **MURRAY METCALFE (MIE 7T7)** PROFESSOR, GLOBALIZATION

Early in 2008 I joined a Task Force formed to respond to a question from the Dean: Given we are living in a time of much greater global interconnections between organizations, what does this mean for the Faculty in terms of how we educate future engineers and how do these global issues relate to our research agenda? As the Task Force began exploring the dimensions of globalization and engineering, three themes clearly emerged in defining a global engineer.

Theme 1: Global Competition and Collaboration

A massive amount of attention is paid to jobs outsourced from North America to other countries, and that outsourcing now includes engineering and technical jobs. We learned from talking to representatives of Canadian high tech companies how engineering jobs move with the manufacturing. When acquiring companies in other locales like Malaysia or Taiwan, a Canadian company may find a whole set of engineering skills, such as optimizing for extremely low cost products, already in place. Whole industries, such as the manufacturing of heavy electrical equipment (including the engineering design work associated with that equipment) have largely picked up and de-camped to South America, as explained to us by

a senior official at Brookfield Renewable Power. What about collaboration, which includes any work done interactively by geographically disparate teams 24 hours a day? Is that something we can explicitly teach?

Theme 2: Environment, Sustainability, and Energy

This theme has come to permeate every aspect of engineering work. Environmental and sustainability issues — once the domain of civil engineers — now are crucial in the chemical, mechanical, electrical, mining, and aerospace disciplines. Engineers across every field understand the stringent requirements now imposed on processes, manufacturing, product disposal, and many other areas.

One alumnus explained the painstaking efforts required under the European Restriction

of Hazardous Substances Directive to track the origin of every component that goes into a circuit board assembly, even when components come from multiple manufacturers. Engineers are beginning to look at lifecycle and the emerging “cradle-to-cradle” design approaches. The energy consumption of products is also a crucial element of all engineering design.

Theme 3: Technology and Engineering in Global Development: Addressing the Issues of the World's Poor

Engineering-driven organizations have a crucial role to play in addressing this theme. In a speech delivered at the World Economic Forum in 2008, Bill Gates called for “creative capitalism” to address the problems of the world’s most in need. He called upon

top corporations (including universities) to devote a portion of their top performers’ time to address issues of the world’s poorest citizens, and to do so in a way that integrates those efforts into the core of the organization.

There have been successful projects in building low cost solutions for use in rugged settings, such as work on low cost LED lighting powered by solar cells to displace the use of kerosene lamps in developing settings. MIT’s NextLab has developed some fascinating prototypes including the adaptation of a cell phone with a camera running artificial intelligence software for use in screening for cervical cancer in remote African villages. There are many opportunities for technology “leapfrogging” in the developing world to avoid the problems created in the advanced economies.

Moving Forward: Global Style

These themes of engineering and globalization continue to gain momentum in the Faculty. Dean **Cristina Amon** is committed to integrating a global perspective, and we have a core group of committed faculty actively addressing these topics. Moreover, we already have a broad range of work that spans borders based on international collaborations. When compared with other Engineering programs, we have an unusually diverse faculty and student body in terms of the countries and cultures represented. The Faculty is ranked No. 10 worldwide in technical education and sits in the heart of an incredibly diverse city.

Planned initiatives based on recommendations of the Globalization Task Force

include new courses addressing globalization themes, integrating a global perspective into existing courses, including some of the core courses taken by all undergraduates, a proposed minor in Globalization, and visiting scholars and speakers, which includes the Globalization Speaker Series that began this term.

Canada's First Centre for Global Engineering at U of T

Additionally, the Faculty has recently launched the Centre for Global Engineering (CGEN). It will have a student education and a research agenda and will link to globalization efforts within the Faculty and elsewhere at U of T. CGEN will also collaborate and partner with other academic institutions in Canada and overseas.

The Faculty is ranked No. 10 worldwide in technical education and sits in the heart of an incredibly diverse city.

How our Alumni can Shape Global Engineering for the 21st Century with a U of T Flavour

We hope alumni will take an interest, and even better, get involved in these initiatives. The U of T global footprint is substantial, in terms of not only where alumni live (basically everywhere), but also in terms of the reach of the organizations for which they

work or are involved in.

Our faculty, students, and alums are diverse. We can literally assemble a team complete with language and cultural skills to work anywhere. We hope to attract the alumni community into these undertakings, and create benefits for all involved. There is an opportunity to shape the global engineer of the 21st century with a U of T flavour!

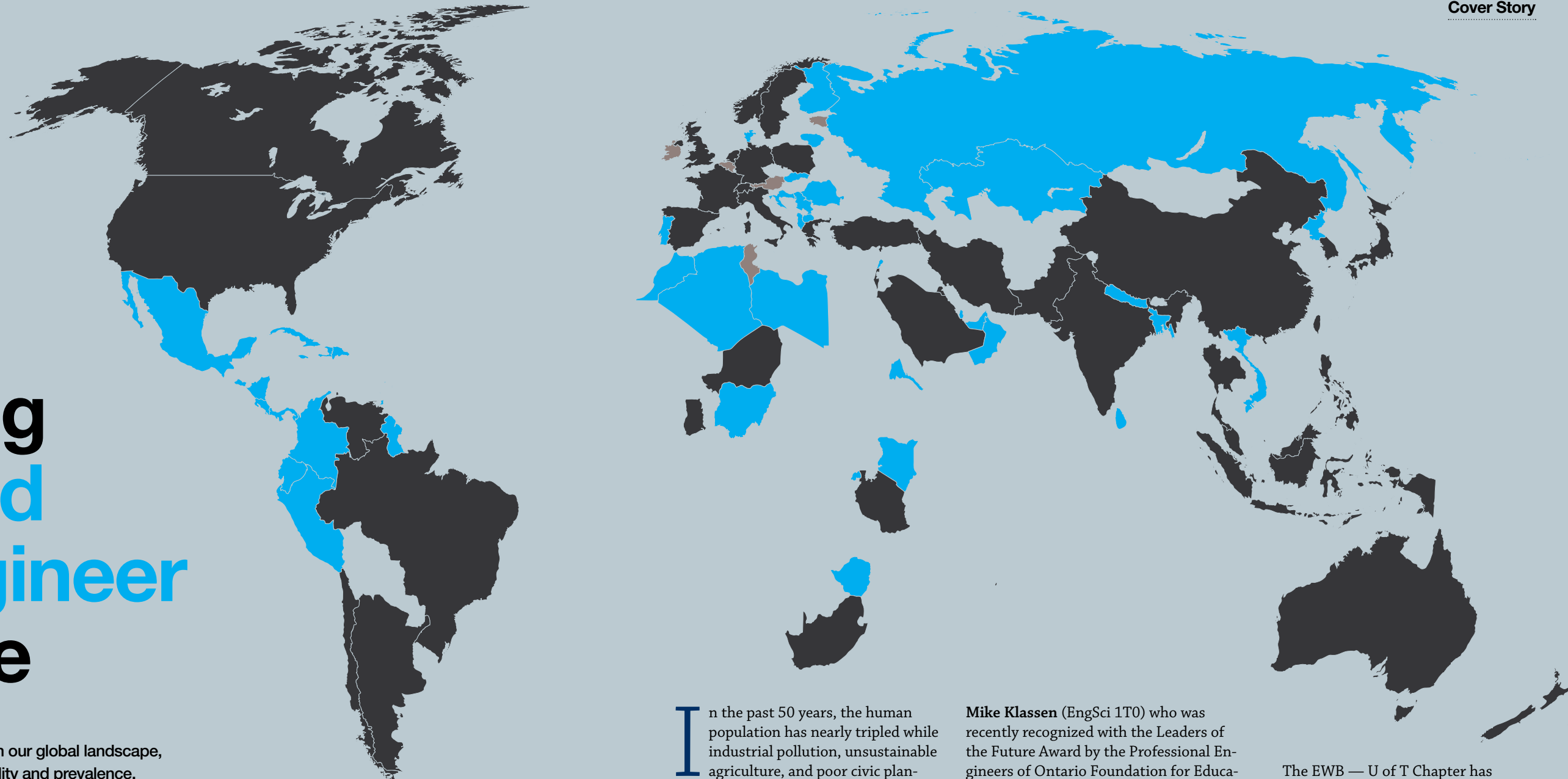
Murray Metcalfe (MIE 7T7) is the Faculty’s newly appointed Professor, Globalization and is an adjunct professor for MIE and CivE. He began his career at McKinsey & Company and then spent over 20 years in the venture capital industry. In the spring of 2008 he was a visiting scholar in the Department of International Development Engineering at the Tokyo Institute of Technology. He holds a MSc and PhD from Stanford University.

Changing the World One Engineer at a Time

As relations between countries increase in our global landscape, the world's largest issues expand in visibility and prevalence. Fragilities in the global economy are pushing developed nations into conditions not seen since the 1920s. Petroleum, which has powered modern society for almost 100 years, may very well be reaching a permanent peak in oil production. And this is just the tip of the iceberg...

This map represents where alumni are located across the globe. Skule™ has 39,771 living alumni with approximately 5% dwelling and working outside of North America. This map also displays where our students are from. Skule™ currently has 6,107 undergraduate and graduate students with approximately 41% coming from outside of North America.

- Students/Alumni
- Students
- Alumni



In the past 50 years, the human population has nearly tripled while industrial pollution, unsustainable agriculture, and poor civic planning have drastically decreased water and food supplies. Furthermore, as debates continue to thrive around the causes of climate change, global warming is an observed fact.

These problems, however, should not defeat us. They should instead be treated as opportunities to stand up and lead.

Skule™ students and alumni are passionate about the world and embrace their responsibility to it by immersing themselves with knowledge, sharing that knowledge, and building a better tomorrow through innovations and inspiration.

“Being a global engineer starts with belief that the future can be radically different from the present, and that our actions can lead to substantial change... A global engineer values equality...and looks beyond individual events to see their connections and relationships,” says

Mike Klassen (EngSci 1T0) who was recently recognized with the Leaders of the Future Award by the Professional Engineers of Ontario Foundation for Education and Engineers Without Borders.

Klassen is one of many Skule™ students devoted to sustainability. The culture within Skule™ supports each of their meaningful ambitions. Programs such as Engineers Without Borders, Engineering Leaders of Tomorrow, and the Professional Experience Year Internship program give Engineering students a crucial understanding of the world and the skills they require to become change agents.

Engineers Without Borders (EWB)

For the 800 million people who go hungry each day and the one billion people who lack access to clean water, poverty is caused by an absence of opportunity. EWB responds to this need, helping people in developing communities gain access to technologies that improve lives.

The EWB — U of T Chapter has grown steadily since its 2001 inception. In November 2008, the Chapter ran seminars for three weeks on “Appropriate Technology” during the First Year Engineering Strategies and Practice course for Core 8 and TrackOne, which reached more than 200 students. Led by **Sabrina Tang** (MIE 1T1) and **Shankar Manoharan** (MIE 1T1), Chapter members designed the seminar content and managed the training sessions. Each seminar was led by one student and one member of the Toronto Professional Chapter of EWB — including current Professional Chapter President and Skule™ Alumna **Nadia Berger** (MIE 0T5).

The seminars focused on understanding the root causes of poverty and the challenges of implementing appropriate technology — particularly with respect to clean water. In a post-event survey 90%



EWB seminar leaders FRONT: Mike Klassen (EngSci 0T9 + PEY), Nadia Berger (MIE 0T5), Maryam Morshiri, Sabrina Tang (MIE 1T1), Luisa Celis, Rachel Alexander, Fidel Labit (CivE 0T8), Ali Ashmead, Tony Tsui (CivE 0T9), and Farukh Javed BACK: Long Nguyen, Mike MacNeil (MIE 1T0), Saurabh Chaubal (MSE 1T0), Shankar Manoharan (MIE 1T1), and William Li (EngSci 0T8 + PEY) missing: Jiayi Zhou (MSE 1T0) and Vivian Cheung (EngSci 1T0).

of students said they would like to help reduce world poverty in some way, and 70% said sustainability is an important factor in designing appropriate technology. After the seminars, EWB witnessed a spike in First Year participation and was invited to submit problems to students enrolled in the second semester's Engineering Strategies and Practice course.

At the 2009 National EWB Conference, U of T sent 36 delegates — more than any other university in attendance — and was honoured with the Award for Best Success in Attract-Engage-Retain. During the conference, five of our faculty members were also heavily involved in discussions surrounding the increased promotion of EWB's integration in Engineering education.

Engineering Leaders of Tomorrow (LOT)

LOT is a comprehensive Engineering leadership program that provides a life-long foundation for transformational leaders and outstanding citizens. The belief of the program is that engineers have a distinct and important role to play in society.

To energize global leaders, LOT offers a Fourth Year and a graduate leadership course, a certificate program with a focus on team skills, leadership lectures, and promotes student and community ties through Faculty and Department working groups led by students.

During the fall semester of 2008, LOT hosted 72 events and training workshops that reached 3,997 students. A revolutionary concept, the program has become an invaluable Faculty asset.

“The complexity of problems throughout the world requires engineers to take broader and more compassionate views towards a solution.”

Steve Dennis, CivE 9T9

“I can honestly say that Leaders of Tomorrow changed my life — and all the changes haven't even taken place yet! After four workshops, I have become aware of aspects of my character that I certainly didn't give much attention to before,” says **Stephen Pinto** (ChemE 1T1) who is eager to start implementing his newfound knowledge.

Professional Experience Year Internship Program (PEY)

The PEY Internship program is Canada's largest internship program, and has been part of Engineering since 1979. In its commitment to provide 12- to 16-month paid internships through paraprofessional opportunities, the PEY program allows students to apply their knowledge in a project-based professional environment, crucial to their ongoing career development. By focusing on the individual development of each student, the PEY team prepares students for local and global internship opportunities.

More than 55% of current Third Year Engineering students are on 2008-2009

PEY internships. These students are interning at over 250 government offices, corporations, and small-size employers. In addition, 8% of 2008-2009 PEY students are on international internships in the following locations: Bangladesh, Botswana, Belgium, France, Hong Kong, Indonesia, Japan, Korea, Spain, Switzerland, and the U.S. In previous years, PEY students have also participated in internships in: Chile, Czech Republic, Qatar, Romania, India, Indonesia, and Taiwan.

Alumni Gone Global

Many of us know **Jeffrey Skoll** (ECE 8T7, Hon. Doc. 0T3) as co-founder of eBay and producer of Al Gore's documentary, *An Inconvenient Truth*. What most of us probably do not know about him is he leads a very important association, the Skoll Foundation.

In 1999, Skoll created the Foundation to pursue his vision of a world where all people, regardless of geography, background or economic status, have the right to enjoy and employ the full range of their talents and abilities.

“I like the idea that philanthropy can be innovative, using the latest advancements to bring results to many people, ideally on a global basis,” says Skoll who believes systemic change in the world can be achieved by investing in, connecting, and celebrating social entrepreneurs.

Grants through the Foundation will assist the American Council on Renewable Energy derive 25% of U.S. electricity and fuels from renewable sources by 2025; has helped train 16,000 teachers at the Afghan Institute of Learning while



Steve Dennis enjoying Sunday afternoon games in Piere, South Sudan (2003).

preparing 165 students for careers as community leaders; and so much more.

After completing his degree, **Steve Dennis** (CivE 9T9) worked in Toronto as a civil engineer. A curiosity to dig deeper into the troubles and complexities of the world led this grad to look further than the newspapers for answers.

In 2002 Dennis left his domestic life and started work with Médecins Sans Frontières (MSF), as a logistician in northern Sri Lanka. Over the last six years, Dennis has worked with MSF in different roles supporting health care programs in Sri Lanka, South Sudan, Somalia, Ivory Coast, Chad, and Kenya.

“Engineering gives tools for people to solve problems. Through my work with MSF I have found that the complexity of problems throughout the world requires engineers to take broader and more compassionate views towards a solution,” explains Dennis who is presently working on a book describing a different perspective of the developing world and the reasoning behind why aid workers do what they do.

Paul Cadario (CivE 7T3) is an en-

gineer who through his integrity and tenacity has shaped a successful 33-year career dedicated to fighting poverty and improving the living standards of people in the developing world.

Upon completing his studies at Oxford, Cadario joined the World Bank in 1975 as a young transport economist in West Africa. In this role, he helped eliminate barriers in distributing funds for poverty reduction. Since then he has worked in China on country strategy and capacity development; managed strategy, finance, and logistics for the Bank's emerging program in the former USSR; and led change management for the Bank's emerging worldwide information systems renewal and roll-out of SAP.

In 2001, Cadario was appointed senior manager, trust fund quality assurance and compliance. His mandate for this position is simple: make the Bank's \$27 billion trust fund portfolio achieve results for the poor.

Philip Yeo (MIE 7T0, Hon. Doc. 9T7) is a visionary who takes on large international projects and produces even larger results.

In 2008, Yeo was recognized with U of T's Engineering Alumni Medal, the highest honour awarded by the Engineering Alumni Association (EAA). To learn more about Yeo and meet all of 2008's EAA Award recipients, please refer to page 20.

Sustainable Education

Although natural resources, time, and world finances are scarce, our imaginations are not.

“It is not education that will save us, but education of a certain kind,” declares David Orr — author of *The Sustainable Revolution*.

Engineers are key in transforming the world. According to the Government of Canada, our country is rapidly moving towards a knowledge-based economy built on innovation and technology. The Faculty of Applied Science and Engineering at the University of Toronto ensures every Skule™ student understands society includes more than just the present one — it includes the future. We accomplish this by preparing our students and graduates with technical skills needed to be globally competitive and valuable.

Recession? What Recession?

STORY BY **CHRISTINE KRUPA**
ILLUSTRATION BY **JAY DART**

“Of all the asset management firms in Canada, we’re the only one that posted net positive sales every month through 2008,” says **Som Seif** (MIE 9T9), president and CEO of Claymore Investments, Inc. “And this is against some of Canada’s largest mutual fund companies, the big banks, and other major players in the fund industry.”

At a time when global financial markets are tanking, investors are watching their holdings shrink, and the economy is in one of its deepest crises in history, Claymore — a provider of exchange-traded funds (ETFs), closed-end funds, and institutional funds — is managing to increase its market share.

Seif, who founded Claymore in 2005, attributes the company’s strong performance in these turbulent market conditions to the numerous innovative

investment products it has launched since its inception. Claymore revolutionized the ETF industry in Canada with affordable products that cover broad markets and make investing in ETFs easy. The company was the first in the world to offer an actively managed ETF (a departure from traditional ETFs, which passively track indices) and ETF wrap portfolios (which combine ETFs in multiple asset classes into one balanced product). It was also the first in Canada to bundle a dividend and interest strategy into an ETF, and to develop ETFs that invest directly in international securities.

Crediting the learning and problem-solving skills he developed as an undergrad, Seif, who regularly appears on the *Business News Network*, says the company’s ability to recognize and respond to shifts in investor thinking and

demand at the market- and investor-level has played a crucial role in the success. “Prior to the down market, we saw there was a movement on the part of investors towards low-cost investment products, and products that provide flexibility and simplicity in investing. Positioning ourselves relative to that has definitely helped us in this environment.”

Of course, Seif, a 2007 recipient of U of T’s prestigious Arbor Award is no stranger to big wins. In the seven years he’s volunteered as head coach of the Varsity Blues men’s water polo team, he’s led the squad to five Ontario University Athletic championships.

Also Serving up Optimism

Other Engineering grads turned Bay Street experts concur that the forward thinking and analytical mindset fostered by their studies has been indispensable in their work in finance.

John Bajc (CivE 8T2), a senior executive financial consultant with Investors Group, explains: “Financial advising is a fact-finding mission. Putting together a proper financial plan for someone involves piecing together many different components — insurance, tax, retirement, estate planning, cash flow management, risk tolerance, and so on — so the analytical abilities immediately kick in. You have to be able to see how everything fits together for each individual client.”

Also responsible for managing assets within those plans, Bajc says a big part of his job is keeping people focused on the long term. With many clients seeing sizable declines in their portfolios, the knee-jerk tendency is to try to avoid losing more money by selling off equities in favor of the money market, treasury bills, and guaranteed investments. As well as advising these clients to maintain their long-term strategies when rebalancing their portfolios (“the markets will eventually recover”), Bajc is encouraging those with cash on hand to step up their investing at this time. “I believe that three to five years from now, we’ll look back and see what a buying opportunity this was.”

In Bajc’s practice, clients at or nearing retirement, on the other hand, already have more conservative portfolios protecting their income stream. “I work with people three if not five years ahead of retirement to design a portfolio that

can weather a minimum of five years in a negative equity environment,” he explains.

Managing risk while exploring opportunities is also a focus for **Donovan Pollitt** (Mining 0T4). As vice president of corporate development at Wesdome Gold Mines Ltd., Pollitt has played a key role in successful project financings, mergers, and property acquisitions since joining the firm in 2004. Wesdome, which currently has two mines in production and a brand new discovery in Val d’Or, Quebec, generated a positive cash flow of \$12.1 million CDN in the first three quarters of 2008, Pollitt reports.

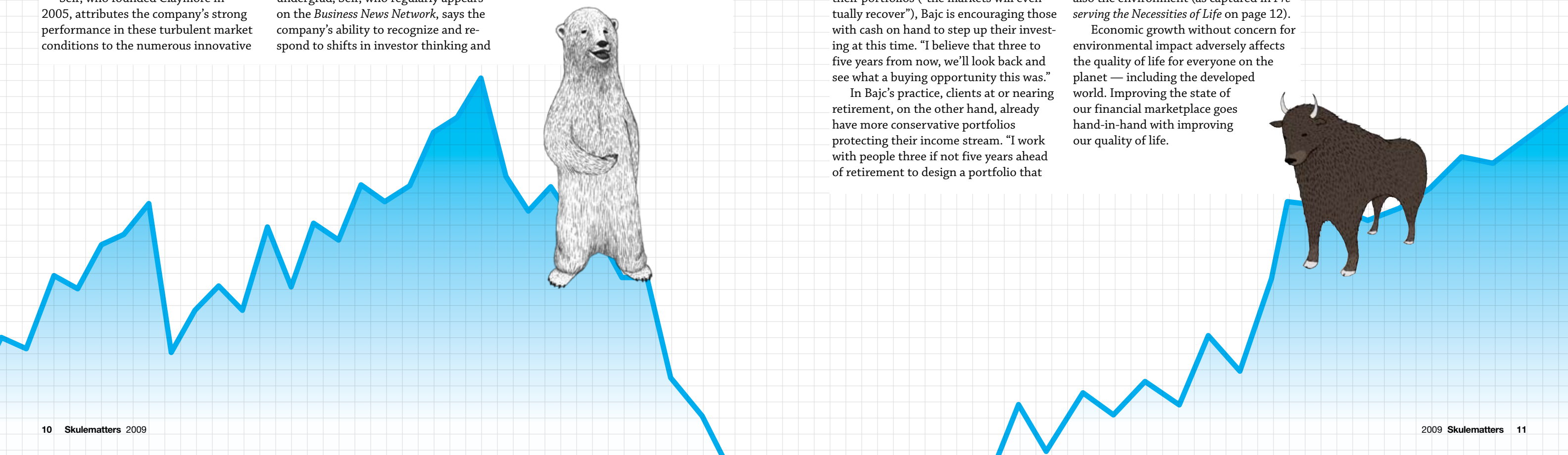
Responsible for evaluating projects within the company and business options outside of it, Pollitt anticipates that, in current market conditions, increasing company revenues and “the lack of risk capital available to smaller development companies should put Wesdome in a good position to repeat its strategy of regional acquisition and development.”

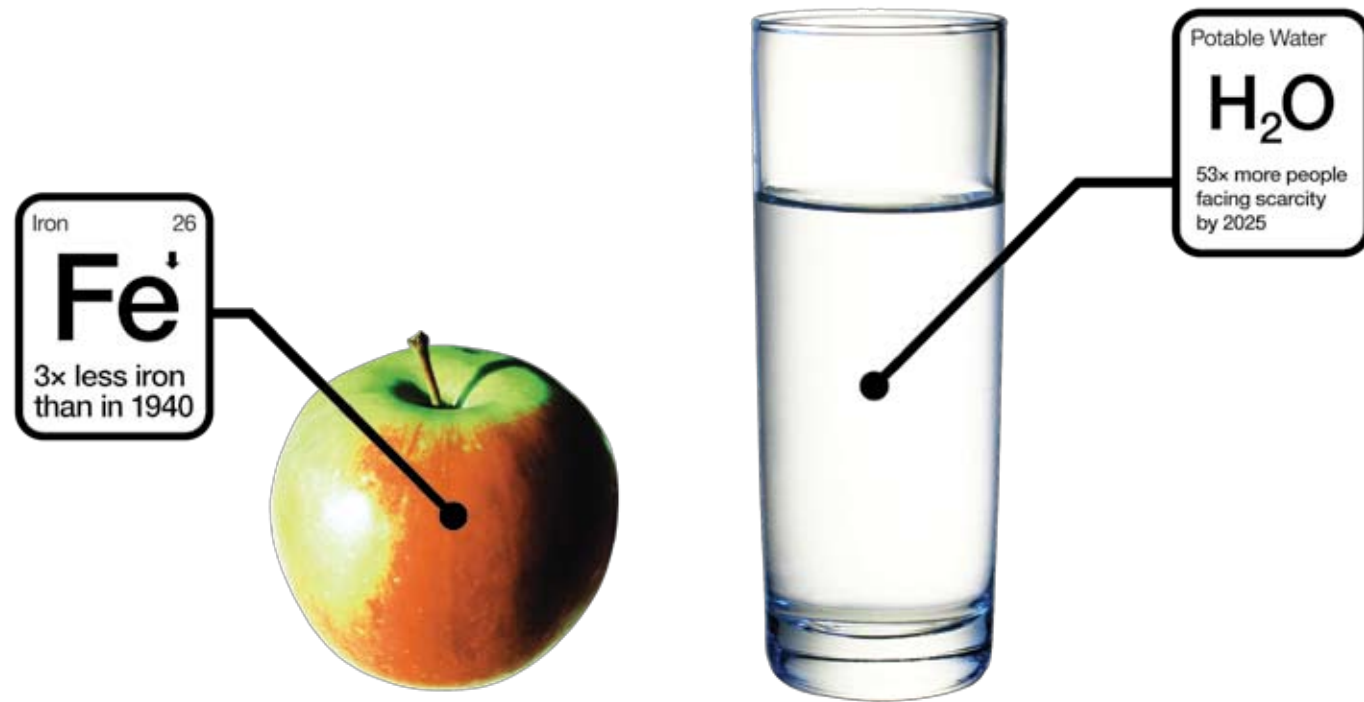
Despite the transformations now rippling through the international marketplace, our Engineers have been able to find bright spots not only in finance but also the environment (as captured in *Preserving the Necessities of Life* on page 12).

Economic growth without concern for environmental impact adversely affects the quality of life for everyone on the planet — including the developed world. Improving the state of our financial marketplace goes hand-in-hand with improving our quality of life.

“Financial advising is a fact-finding mission. Putting together a proper financial plan for someone involves piecing together many different components... so the analytical abilities immediately kick in. You have to be able to see how everything fits together for each individual client.”

John Bajc, CivE 8T2





Preserving the Necessities of Life:

Staying one Step Ahead of a Global Natural Resource Crisis

STORY BY JENNY LASS

As our global economy melts down, it's easy to forget about the impact of consumerism on our natural resources. Threats to our air, water, and food supplies are looming as real as our dwindling markets, and if we don't offset the demands on our ecosystems, these "necessities of life" may disappear.

Many of our problems stem from our dependence on fossil fuels. When these fuels are burned to generate energy, they emit greenhouse gasses (GHGs), such as carbon dioxide (CO₂), which contribute to global warming. Canada's GHG emissions have only declined by 3% since 2004 and our fossil fuel use remains high.

Environment Canada predicts that this warming will shrink potable water supplies, increasing the number of people

facing water scarcity from 600 million to 3.2 billion by 2025. Droughts will also destroy farmland, and high growing season temperatures will wither heat-sensitive crops, such as wheat.

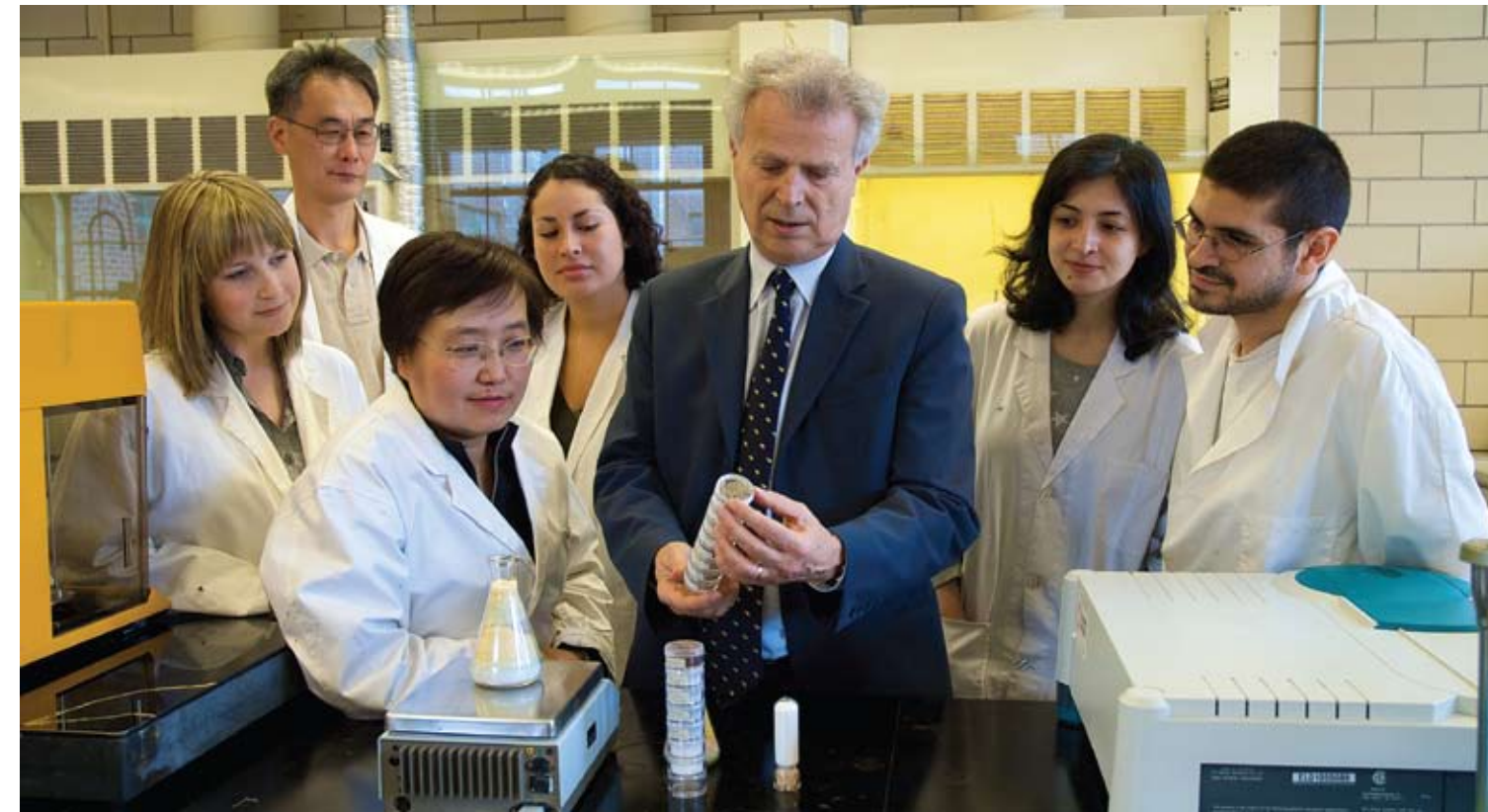
But even without the help of global warming, our resources are deteriorating. Non-GHG emissions are destroying air quality, and Canadians are dumping over 360 chemicals into the Great Lakes. Plus, poor farming practices have robbed our food of nutrients — apples now have three times less iron than they did in 1940.

Clearly sustainability has to become more reality than buzzword. Fortunately, U of T's Faculty of Applied Science and Engineering graduates are undertaking the complex challenges involved in preserving our natural riches. They are

finding ways to decrease energy use, to generate renewable and sustainable energy, and not only reduce hazardous waste, but also recycle it.

This "cradle-to-grave" approach is apparent in the innovations of Eco-Tec Inc. run by Chemical Engineer **Phillip "Rocky" Simmons** (ChemE 6T4, MAsC 6T5, PhD 6T8). Eco-Tec's BgPur™ gas purification system transforms hydrogen sulfide and methane released by industrial processes into fertilizer and biofuel, and their newly developed AmiPur® CCS technology assists in the capture of CO₂ so it can be stored or re-used for oil production.

This CO₂ recycling, called carbon sequestration, is still in its infancy, but Simmons predicts that it's "going to become a big movement" over the next



Professor Levente Diosady (center) and his graduate students examine grains of rice.

decade due to its environmental and economic benefits.

A similar sustainable paradigm shift is occurring in water purification, "as the water industry begins to face the challenges of high energy costs, energy scarcity [and] GHG regulations," says **Kevin Waher** (CivE 0T5, MAsC 0T8), a civil engineer at Wardrop Engineering.

Advanced Oxidation Processes (AOPs) are effective but often costly emerging water treatment technologies that could be targeted for a sustainability overhaul. AOPs, which typically combine hydrogen peroxide and ultraviolet radiation or ozone gas to improve their contaminant-destroying abilities, can have large energy demands, but are able to clean water "when conventional technologies can't," according to **Linda Wojcicka** (MAsC 0T4), a process designer at Associate Engineering.

However, some of the most sustainable water treatment technologies exist where potable water is scarce. The simple, small, and robust BioSand Filter uses slow sand filtration to provide individual households with up to 80L of drinkable water daily, "regardless of their proximity to an urban centre or water treatment facility," says **Ray Cantwell** (PhD 0T7) who works for Samaritan's Purse Canada.

Although solutions to food shortages in developing countries are less sustainable, they are no less important. Chemical Engineer and U of T Professor **Levente Diosady** (ChemE 6T6, MAsC 6T5, PhD 6T8) is working to make what little food exists count for more, by fortifying food with microencapsulated nutrients. One of his recent successes was double fortifying salt with iodine and iron. It sounds straightforward, but Diosady says that micronutrients "sometimes react with each other" and destabilize or alter the taste of food.

"Where food is abundant, environmentally conscious technology is more prominent; we are changing packaging systems to protect food supplies and the environment. Aseptic technology used for foods such as yogurt drinks and soups is complex and expensive," says Chemical Engineer **Arlene Karan** (ChemE 9T6, MAsC 9T8), but it is creating a safer food industry, delivering fresh taste, and saving energy because aseptically packaged food requires no freezing or refrigeration.

Despite the obstacles involved in balancing our economy and environment, it seems that our potential for finding solutions is perhaps greater than our potential for failure. In addition, the cre-

ation of new technology, knowledge and jobs to address environmental concerns, produces economic opportunities for our nation.

According to the Government of Canada, "what is important to remember is that impacts on human health, the environment and the economy do not exist in isolation, they are linked. For instance, decreased forest productivity because acid rain has damaged the soil may lead to increased stresses on the pulp and paper job market. Similarly, a focus on finding better economic incentives for reducing air pollution can, in turn, improve human health and create new research opportunities."

The Faculty of Applied Science and Engineering at the University of Toronto relies on an integrated approach to understanding and addressing the impacts of environmental issues and discovering the best ways to tackle those challenges.

Every Department, Division and Institute of the Faculty is committed to improving the world's living conditions, and will continue to incorporate environmental considerations into research and the curriculum, for the creation of wealth and technological prosperity around the globe.



New Centre for Global Engineering

On May 27, 2009 the Faculty of Applied Science and Engineering announced the creation of a new Centre for Global Engineering (CGEN) that will prepare graduates for a global workplace and direct research towards international challenges.

The new Centre will play a key role in both the education and research mission of the Faculty by promoting interdepartmental and interdivisional research and other scholarly activities related to Engineering in a global environment.

CGEN was among the recommendations of the Dean's Task Force on Globalization and Engineering, which was established in early 2008 to consider how the Faculty's education and research missions should take into account globalization trends and challenges.

The Centre will include a Director, a new academic position Professor, Globalization, affiliated faculty members, along with part-time administrative support. Professor **Yu-Ling Cheng**, of the Department of Chemical Engineering and Applied Chemistry will begin a

three-year appointment as Director, and **Murray Metcalfe** (MIE 7T7) began the appointment as Professor, Globalization in April.

"CGEN will be a community of scholars who share an interest in global engineering issues — a mechanism for exchanging ideas and sharing best practices that will potentially influence research directions to increase alignment with global challenges, as well as enhance the global impact of engineering research," said Dean **Cristina Amon**.

The Task Force defined global engi-

neering to include international collaboration and competition with respect to engineering work; the role of sustainability and environmental considerations and global energy analysis in engineering decisions; and the role of technology and engineering in international development and addressing the needs of the world's poorest citizens. CGEN will work in each of these areas.

The educational goals for the Centre include offering courses and organizing a speaker series to enhance the global experience for Engineering students.

Professor Metcalfe teaches a course **Innovative Technologies and Organizations in Global Energy Systems**, which will be offered this fall as APS 510 and may become a core or elective course for a future **Globalization** minor or graduate certificate program in **Global Engineering**. Additional courses with a global emphasis are being planned.

The Task Force organized a preliminary speaker series this past spring semester, including internationally renowned speakers from MIT and U of T. CGEN will continue to recruit top global leaders for the speaker series each semester.

Another mandate for CGEN includes building partnerships within and also outside U of T to provide opportunities for students to travel and learn abroad, as well as embrace the knowledge and skills of the international community to effectively boost global innovation.

According to the Organization for Economic Co-operation and Development countries benefit from the inflow of talented students and scholars. For receiving countries, the inflow of talent

has positive effects relating to knowledge flow, including the possibility of increased R&D and economic activity owing to the availability of additional skilled professionals, improved knowledge flow, and collaboration with sending countries. Mobility helps link domestic firms to foreign knowledge and stimulates spillovers from foreign R&D to local R&D units and the economy at large.

Research activities within the Faculty of Applied Science and Engineering either explicitly or implicitly address international development goals. Through CGEN the Faculty will open the door for formal dialogue and work within Engineering at U of T.

"It is our hope the Centre will be the face of global engineering to both internal and external communities. We hope students will see it as the focal point of the Faculty's educational initiatives related to global engineering. We anticipate the presence of CGEN will identify to potential external partners the research and educational activities on global issues that exist within the Faculty, and will thus lead to collaborative opportunities," said Dean Amon.

The research agenda for CGEN may include:

- Discipline specific research relevant to global issues, such as renewable energy for rural settings, water purification, cost reduction of healthcare technologies, communications technologies for developing countries, and international food engineering.
- Knowledge translation to enhance the global impact of engineering research, or translating best engineering practices into global applications; comparative engineering approaches across regions and types of organizations; incorporating location-specific constraints into engineering design.
- "Cradle-to-cradle" life cycle analysis; accounting for sustainability issues and energy consumption in engineering projects.

"The tremendous research strengths in the Faculty allow CGEN to further enhance and expand existing research efforts in highly impactful and visible ways," says Cheng.

"The tremendous research strengths in the Faculty allow CGEN to further enhance and expand existing research efforts in highly impactful and visible ways."

Yu-Ling Cheng, CGEN Director

New Institute to Protect Identity, Privacy, Security

In a world where online financial transactions around the globe can easily occur, and communication across borders is as easy as clicking 'send' or logging into Facebook, digital security issues are increasingly becoming critical to ensuring a stable global marketplace.

On May 27, 2009, the Faculty of Applied Science and Engineering approved the creation of the **Identity, Privacy and Security Institute (IPSI)** to provide leading education programs and conduct pioneering research to develop innovative new approaches to privacy that maintain the security, freedom, and safety of the global community.

"With the recent introduction of enhanced driver's licenses and new border crossing controls, it is even more critical that we provide innovative engineering solutions for privacy enhancing security and surveillance," said the Institute's Director, Professor **Dimi- trios Hatzinakos**.

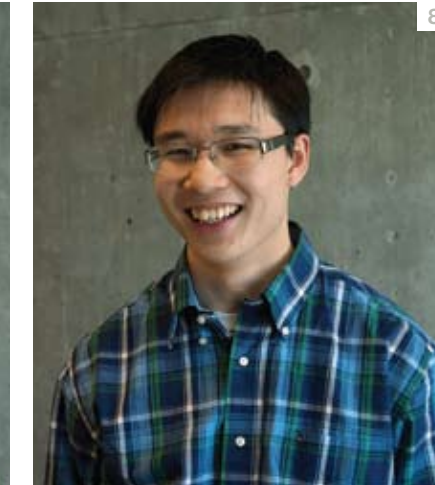
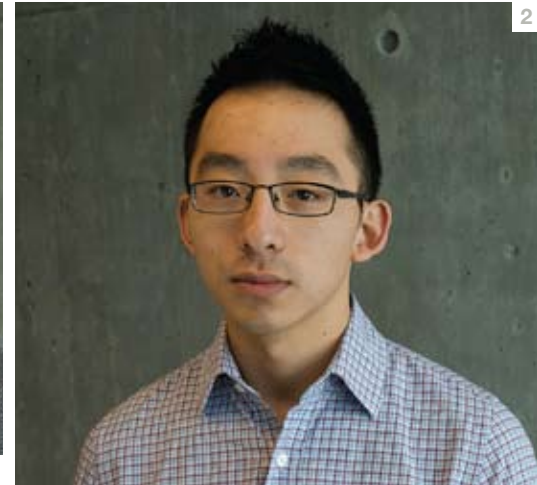
"As more tools become available, like internet banking and Twitter, privacy and protection for our citizens becomes more and more crucial to prevent identity theft. However, we also provide solutions to use technology in new ways. Imagine a wireless Body Area Network that protects any information you are transmitting — whether you are talking or texting on your cell phone, or using your laptop at home — in a cost-effective and completely secure way. This is just one of the exciting research projects at IPSI."

The newly formed Institute's research and education initiatives began in 2007 when Professor Hatzinakos and Professor **Kostas Plataniotis** from the Faculty of Applied Science and Engineering and Professor **Andrew Clement** from the Faculty of Information, created the Identity, Privacy and Security Initiative after receiving funding from the University of Toronto Academics Initiative Fund (AIF). Since then, a growing number of researchers with multidisciplinary expertise have joined the Institute.

The Institute programs include a **Master of Engineering** with a focus in security technology and **Master of Information Studies** with a concentration in security policy. The Institute will be located on the seventh floor in the Bahen Centre for Information Technology.

2009 Cressy Award Winners

The Gordon Cressy Student Leadership Award was established in 1994 by the University of Toronto Alumni Association and the Division of University Advancement to recognize students with outstanding extracurricular contributions to their College, Faculty, or the University as a whole.



2009 Cressy Award Winners

1 Jonathan Asmis

EngSci OT8 + PEY

As president of U of T's Engineering Society, Jonathan bid and won the rights to construct Hard Hat Café — a new food service outlet in the Sandford Fleming Building. For this project, he put in full workweeks to manage renovation, hire managers and staff, and negotiate contracts with various vendors. Currently, Jonathan leads the Atrium Renovation Project for the Sandford Fleming Building, which is scheduled for completion later this fall. "Student leaders devote countless hours to the Faculty not for the experience or how good it may look on a resume, but because we truly care and believe that if we work hard enough, our contributions will be felt by someone," says Jonathan.

2 Derek Chang

ChemE OT9

Derek has consistently shown leadership and commitment to the Department of Chemical Engineering and Applied Chemistry through his involvement in the Student Chapter of the Canadian Society of Chemical Engineering. During the academic year of 2006-2007, he was appointed cultural director of the Chinese Engineering Student Association. Currently, he leads the Catalyst Program, providing mentorship and coaching for First Year Chemical Engineering undergrads. "My reason for taking on leadership roles at the University is not just for my own personal growth. I saw it as an opportunity to make

a positive impact on a larger audience," says Derek.

3 Kristen Faccioli

EngSci OT9

Kristen shines as a leader. She has made significant contributions to the student community as chair of the U of T Space Design Contest and vice-chair of the Canadian Aeronautics and Space Institute. Kristen is actively involved with the Division of Engineering Science and the Faculty regarding recruitment events and improving the undergraduate experience. In her spare time, she provides mentorship to high school students primarily through the Skule™ Sisters Mentorship program, and tutors students as well. "To me, seeing others succeed is very satisfying," says Kristen.

4 Ramy Ghattas

MIE OT8 + PEY

Ramy demonstrates exemplary leadership qualities in a wide range of activities. As president of U of T's Robotics Association, he has grown the organization to well over 100 team members and plays a key role in mentoring high school participants. Ramy is also the co-founder of the Mechanical and Industrial Engineering Mentorship program, which in its first year attracted 84 participants. In the community, Ramy is a volunteer director of a youth organization that arranges various events and trips for 250 youth members, and coordinates a tutoring program targeted at recent immigrant families who cannot afford tutors for their children.

"I highly value students' role in the infrastructure of the community and have been fortunate to help inspire a similar interest in others," says Ramy.

5 Vicki Komisar

EngSci OT9

Vicki's extracurricular pursuits improve lives inside and outside U of T. Her dedication to the varsity swim team while maintaining a full course load is impressive. On top of this, Vicki is a volunteer swim coach with Special Olympics Ontario, a mentor for the Skule™ Sisters Mentorship program, and a key member of the Division of Engineering Science's Leaders of Tomorrow Working Group. Her contribution to these volunteer initiatives speaks loudly about her character. "As U of T Engineers, we often don't understand how privileged we are. Through my work, I hope to both give back to the community that has nurtured so many opportunities for me, and convince other students that they too can do the same," says Vicki.

6 Alp Kucukelbir

ECE OT9

Throughout his education, Alp has made it his top priority to participate in as many extracurricular activities as possible. He is currently serving as The Edward S. Rogers Sr. Department of Electrical and Computer Engineering's representative to the Faculty's Leaders of Tomorrow Working Group. In this role, he plans and executes leadership activities for students. Last year, he worked as the executive editor

of Skulebook where he seamlessly aligned his peers towards a common vision. In recognition of Alp's leadership skills, he was chosen as the inaugural recipient of the ECE Leaders of Tomorrow Award. "There are so many leaders in our Faculty. I am humbled to receive a Gordon Cressy Award, and am grateful for the opportunities presented to me throughout my studies," says Alp.

7 Judith Lau

EngSci OT8 + PEY

Judith's involvement with the NSight Mentorship program, since 2004, has helped many First Year Engineering Science students transition effectively. NSight's success has also inspired The Edward S. Rogers Sr. Department of Electrical and Computer Engineering and the Department of Mechanical and Industrial Engineering to start their own mentorship programs. On top of her busy schedule, she finds the time to passionately contribute to Women in Science and Engineering and the U of T Society of Manufacturing Engineers. During her PEY experience in Switzerland, she mentored foreign trainees and organized weekend outings through the International Association for the Exchange of Students for Technical Experience. "Faculty and peers often ask why I'm so busy with leadership activities and I simply tell them because I want to be. I want to transform things. Leadership is infectious, and it's rewarding to see the community become a better place through collaboration," says Judith.

8 William Li

EngSci OT8 + PEY

During his education, William has always tried to have a positive impact on other students and in the community through contributions to the Division of Engineering Science and the world at large. William co-chaired a festival at Yonge-Dundas Square promoting volunteerism to Toronto's youth, created a Global Citizens Conference while completing his Professional Experience Year in Switzerland, and currently mentors First Year students with their transitions. In 2007, his leadership of the U of T Chapter of Engineers Without Borders was recognized with Canada's Most Improved Chapter of the Year award. "Getting involved is both an opportunity and obligation of being a citizen in every community I am a member of, both at U of T and beyond," says William.

9 Daniel Ludwin

CivE OT6 + PEY, MBA OT9

Daniel is a proven leader. Chair of Rotman's 2008 Corporate Social Responsibility North America Case Competition, Daniel led a small team in transforming the event from a local competition into an international showcase. Also, he is the coordinator of the Rotman Student Exam Bank that remedies inequalities in the academic program. In his spare time, Daniel spends countless hours tutoring high school students. "My education and time spent at U of T has been a great opportunity to contribute to the

campus and city communities. Hopefully these activities will also make it easier for future students to get involved themselves," says Daniel.

10 Daniel Marquez

MIE OT8 + PEY

Throughout Daniel's years at U of T, he always felt compelled to get involved in various aspects of campus life. In the spirit of this endeavor, he became an avid contributor each year to Frosh Week helping students ease into University life. In the academic year of 2008-2009, Daniel took on even greater responsibility. He now chairs the Industrial Engineering Club — an effort that enhances the lives of many students. "I want to give back whatever I can to the Faculty and Department that has provided me with so much in the way of education and life experience," says Daniel.

11 Twishansh Mehta

MIE OT9

Twishansh served his fellow Mechanical Engineering students through various volunteer and leadership roles. He is a student representative at the international level for the American Society of Mechanical Engineers (ASME); chair of ASME's University of Toronto Student Section; mentor to First Year students; vice president finance of the annual U of T Engineering Competition (UTEK); and liaison to the FIRST Robotics Mentorship program. In addition, Twishansh founded and currently advises the Toronto Chapter of Shad Valley Alum-

ni. "I believe that my passion for the activities that I take part in has transferred over to other students. I participate in these activities to help other students develop their own drive to succeed in and out of school," says Twishansh.

12 David Schacter

EngSci OT8 + PEY

David's participation as an executive in numerous clubs and organizations has enriched student life at U of T. Be it as the finance director of the Engineering Science Club, member of Engineering Leaders of Tomorrow, captain of U of T's Ontario Engineering Competition team, or captain of the varsity fencing team, David demonstrates an ability to effectively organize and motivate others to achieve success. "I love helping people to challenge themselves and reach goals even greater than my own," says David.

13 Patricia Sheridan

MIE OT9

Patricia's contributions promote individual excellence and confidence in many. Her coordination, since 2006, of the FIRST Robotics Mentorship program provides high school students interested in robotics with the resources and ability needed to achieve their aspirations. Throughout her education, Patricia held a number of student leadership roles, including UTEK director and ASME FIRST Robotics representative. "It is through these roles that I have been able to achieve my own personal excellence and motivate

those around me to pursue theirs," says Patricia.

14 Massimo Tarulli

ECE OT7, MASc OT9

Massimo is an outstanding researcher who spends his free time teaching young children how to swim and volunteering at Sick Kids Hospital. "My experiences as a student athlete, coach, mentor and volunteer have been the most rewarding in my academic career. Each role has provided me with a better perspective on what it means to really help others. These activities have brought a better sense of purpose to my education and have fueled my drive to continue to serve my community in any way I can," says Massimo.

15 Andrew Peter Voth

CivE OT4, PhD OT9

Andrew demonstrates a willingness to provide constructive knowledgeable advice, assistance, and leadership to the University, as well as professional and community groups while maintaining high academic achievements. His three-year term as president of the Civil Engineering Graduate Student Association and participation with the Civil Engineering Academic Council enabled the student voice to be heard by U of T leadership. "My leadership roles have allowed me to increase student involvement in University activities, represent the opinions of students, enhance the student experience, and impart my leadership experience to others," says Andrew.

Engineering Alumni Association Awards

Twelve awards were presented to notable Engineering alumni this fall by the Engineering Alumni Association (EAA) in recognition of outstanding achievement and leadership in furthering the engineering profession. "We are proud of the accomplishments and contributions of this year's distinguished award recipients," said Cristina Amon, Dean, Faculty of Applied Science and Engineering. "I would like to take this opportunity to extend my sincere gratitude to the Alumni Awards and Honours Committee, led by Ron Venter, whose dedication to our Faculty and his outstanding spirit of volunteerism is deeply appreciated."



1 Philip Yeo
MIE 7T0, Hon. Doc. 9T7

Philip is the 2008 recipient of the Engineering Alumni Medal, the highest honour awarded by the EAA that recognizes outstanding achievement. Philip's work directly influenced the transformation of Singapore into one of the Four Tigers of Asia.

Over the course of his career, he implemented Singapore's highly successful industrial development policies, attracted billions of dollars in foreign investment into the country (notably in biomedicine, semiconductors, aerospace and chemicals), created over 280,000 jobs, and established scholarship programs that provide Singapore students with opportunities to study abroad.

2 Kathy Milsom
CivE 8T3

Kathy received the 2T5 Mid-Career Award. Kathy is president and CEO of the Technical Standards and Safety Authority — an innovative, self-funded non-government organization focused on delivering services in support of public safety in sectors such as fuels, amusement devices, elevators, ski lifts, pressure vessels, and upholstered and stuffed articles.

In the past, she has served as president of Vestar Facility Management, a start-up business and subsidiary of the utility company Cinergy Corporation, director of Vertical Markets for North America, and regional director of Healthcare Support Services for Johnson Controls World Services Inc.

Her government experience spans the federal government, as president and CEO of Canada Lands Company Limited, acting commissioner of City Property and director of Facility Planning, Design and Construction for the City of Toronto, and project manager with the Ministry of Government Services for the Province of Ontario.

3 Gino Palumbo
MSE 8T3, MASc 8T5, PhD 8T9

Gino is also a 2008 recipient of the 2T5 Mid-Career Award. Gino's company, Integran Technologies Inc., creates and markets nanotechnology applications used in the transformation of metals. Already a rising star in the international scientific community, in 1989 he graduated with his doctoral degree and joined Ontario Hydro in a new applied research job. There, he and Uwe Erb (now a Professor at U of T Engineering) developed a nanotechnology technique for more economical repair of nuclear reactors, now widely used to preserve generators in nuclear power plants.

Gino and his team also developed a technique for extending the life of lead acid car batteries, which was spun off by "Hydro" in 1999. This R&D continues to flourish through Integran, driven by Gino's ability to focus on practical applications and provide new directions for a creative scientific enterprise.

4 David Sinton
MIE 9T8, PhD 0T3

David received the 7T6 Early Career Award. An associate

professor of Mechanical Engineering at the University of Victoria, he is on the front line of microfluidic and nanofluidic research with biomedical and energy applications.

David received the Gold Medal of the Canadian Society for Mechanical Engineering and the Centennial Thesis Award upon graduating from Mechanical Engineering at U of T. An NSERC graduate scholarship took him to McGill for a master's degree in 2000 where he studied the development of a computational model for fluid flow and heat transfer in phase change systems. This work brought him back to U of T where he further developed his interest in microfluidics.

5 Márta Escedi
CivE 7T6

Márta is the 2008 recipient of the Malcolm McGrath Award. Márta served as director of alumni relations in Engineering from 2001 to 2006 and devoted many years to the advancement of the University as advisor to the Dean on women's issues.

During her work as director of alumni relations, Márta helped the Engineering Alumni Association develop a new constitution and a chapter system for Engineering alumni across Canada. In addition to the University, Márta has been strongly committed to Professional Engineers Ontario, as chair of various committees, and is a recipient of the PEO Order of Honour. She has also been long involved as director for the Board of Governors of Havergal College in Toronto.

6 David Rutt
MIE 0T8

David received the L.E. (Ted) Jones Award for achieving distinction in academics while making a significant contribution to the arts.

A graduate of Industrial Engineering, he has made noteworthy contributions to Skule™ music. He also extended the scope and attraction of "Engineering music" through the outstanding execution of the 25th reunion concert of the Skule™ Stage Band.

From an extensive background in high school music, David joined the Skule™ Stage Band. In his Second Year, he was invited by Chris Roscoe (L.E. Jones Award recipient in 2007) to play trombone in a brass quintet, which led to the creation of the Brass Ring.

7 Rachel Castelino
ChemE 0T7 + PEY

Rachel also received the L.E. (Ted) Jones Award. Rachel's passion for music began in elementary school where she began to immerse her interest in a variety of instruments. She was an active participant in the Engineering Leaders of Tomorrow program, chief engineer for her Fourth Year Plant Design project, and emcee and performer for the Chemical Engineering Annual Department Dinner.

Rachel is an accomplished public speaker and advocates many causes. She was a member of the Engineering Choir and has been a featured vocalist at a number of Engineering events.

Engineering Hall of Distinction

The Engineering Alumni Association selected an assembly of extraordinary alumni for induction in the Engineering Hall of Distinction. Selected for membership for their lifelong accomplishments, these graduates have ultimately defined success in the Engineering profession. Formal induction into this prestigious Hall, which is located in the Sanford Fleming Building, took place during Spring Reunion in May.



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1 Byron "Ike" Goodfellow ECE 5T3, MAsc 5T4

Byron worked with Philips in the application of the transistor technology used in the first generation of colour televisions.

Upon completing his master's degree, Byron switched to IBM and focused on the use of computers in a variety of engineering applications, including pipe stress analysis in submarines. This led to his appointment as the first director of the IBM Lab. There, he realized exotic software was the future for computers and recommended the concentration of a new lab be on software applications instead of hardware development — a shift that has led to an IBM Canada Lab with over 10,000 employees.

By 1977, Byron was director of operations for IBM Ottawa, where he became involved in the development of security features for computers, including complex encryption methods — techniques that still have wide application. His contributions at IBM helped influence the evolution of the organization as a software leader.

In 1988, he joined Nortel as account vice president, secure network applications, heading the customer application team of Bell Northern Research organization. Byron also worked with the National Research Council, the Defence Research Establishment and the Communication Security Establishment for DND. He continues to consult in these matters.

2 Joey Tanenbaum CivE 5T5, Hon. Doc. 9T8

Joey's outstanding business

achievements have helped fund a wide-range of educational and civic philanthropic initiatives.

Joey enrolled in Engineering in 1950 while working at York Steel Constructions, his family's firm. While working there Joey launched a series of contributions that led to the assembly of structural steel, helping his family's firm become the leading Canadian enterprise in this business. It also propelled him to the position of CEO of York Steel in 1978.

After some time in the industry, he founded Jay-M Enterprises Ltd., which includes LOC-Pipe Inc., one of the leading manufacturers of gravity sewer pipe and other precast concrete products. Some of his business ventures include Hugh Russell Reliance Steel and Hydro Pontiac.

Joey's generosity and commitment to the Faculty of Applied Science and Engineering funded the first Endowed Chair and helps support a number of need-based and academic scholarships for Civil Engineering.

3 Lorne Mitchell EngPhys 5T3

Lorne is known as a pioneer in the development of new heating and cooling systems, which are critical cost elements in both the construction and operation of facilities.

In 1953, Lorne began his career at CIMCO — a company that supplies design build services for both low temperature refrigeration and air conditioning projects across Canada. In 1959, he left CIMCO to join one of his

colleagues at R.T. Tamblin and Associates, now The Mitchell Partnership Inc. (TMP) where he was elected president in 1973.

TMP grew steadily under Lorne's exemplary leadership and his commitment to building loyal staff dedicated to excellence, innovation, and quality. Today, the consulting partners have a record of global accomplishment and professional distinction.

4 Glynn Williams EngSci 7T8, MAsc 8T0

Glynn is a distinguished leader in the fields of aviation and investment banking. In aviation, Glynn is the founder and CEO of Reliance Aerotech Inc., a leading independent North American maintenance, repair and overhaul organization, serving some of the most prestigious organizations in both civilian and military aerospace sectors. He is also CEO of the Williams and Moore Capital Corporation, a private equity investment firm he has owned since 1991.

Early in his career, Glynn became recognized as one of Canada's leading financial analysts, with more than 20 years experience in venture capital and economic development. He helped create and build Newcrest Capital, Canada's leading independent investment house, which was acquired by TD Bank Financial Group in 2000. This enabled Glynn to continue his passion to build companies including Reliance Aerotech Inc., the largest independent regional aircraft MRO in North America, which he later acquired and led as CEO.

Glynn is also CEO of Nav-house Corporation, the global leader in sustainment of sophisticated inertial navigation systems.

Glynn volunteers in a number of community activities, including key committees and boards at the U of T where he aims to inspire young engineers. His contributions support The Glynn Thomas Williams Fellowship for doctoral studies in Engineering, which provides full funding to recipients and emphasizes research with commercial prospects that benefit Canadians.

5 Brian Levitt CivE 6T9

Brian combines his background in Engineering, law, and business. He is now co-chair of Osler Hoskin & Harcourt, practicing in Montreal.

Upon graduating from Civil Engineering in 1969, Brian continued his studies at U of T in the Faculty of Law, earning his LLB in 1973. After two years working as a lawyer for the federal government's Anti-Inflation Board, Brian joined Osler Hoskin & Harcourt in 1976. In 1979, he became a partner for this distinguished firm.

In 1991, Brian joined Imasco Limited as president, and became CEO in 1995. However, in 2000 British American Tobacco bought the company to acquire Imperial Tobacco. Controlling interests in Canada Trust and Shoppers Drug Mart were later sold off as well. Brian returned to Osler as co-chair — opening the firm's Montreal office in 2001.

Faculty Awards & Accolades

As an educational institution devoted to research and global innovation, the Faculty of Applied Science and Engineering at the University of Toronto is focused on providing its students with the most relevant and cutting-edge knowledge. As a result, the Faculty is extremely proud to receive so many awards and acknowledgements over the last year, including being ranked No. 1 in Canada and among the top 10 in the world for Engineering by the Times Higher Education — QS and U.S. News and World Report. Congratulations to members of the Engineering faculty, staff, and alumni who received major recognitions between April 2008 to June 2009.

<p>Agnes Kaneko Award <i>Faculty of Applied Science and Engineering</i> Linda Espeut</p>	<p>Computer Engineering and Science Award <i>Institute of Electrical and Electronics Engineers</i> Professor Emeritus Kenneth (K.C.) Smith EngSci 5T4, MASC 5T6, PhD 6T0</p>	<p>Excellence in Innovation in Civil Engineering Award <i>Canadian Society for Civil Engineering</i> Professor Constantine Christopoulos, Juan Carlos de Oliveira MASC 0T6, Professor Jeffrey Packer</p>	<p>Fellow, Biomaterials Science and Engineering <i>International Union of Societies for Biomaterials Science and Engineering</i> Professor Molly Shoichet</p>	<p>Fellow <i>Institute of Electrical and Electronics Engineers</i> Professor Francis Dawson ECE 8T2, MASC 8T6, PhD 8T8, Professor Brendan Frey PhD 9T7, Professor Jorg Liebeherr, Chair Jonathan Rose EngSci 8T0, MASC 8T2, PhD 8T6</p>	<p>Graduate Teaching Award <i>Faculty of Medicine</i> Professor Christopher Yip ChemE 8T8</p> <p>Heat Transfer Memorial Award <i>American Society of Mechanical Engineering</i> Dean Cristina Amon</p>	<p>McLean Award <i>U of T</i> Professor Peter Zandstra</p> <p>Northrop Frye Award <i>U of T</i> Chair Bryan Karney</p>	<p>Senior Prize <i>International Photoacoustic and Photothermal Association</i> Professor Andreas Mandelis</p>
<p>Breaking the Glass Ceiling Award <i>WISE U of T</i> Milica Radisic</p>	<p>Distinguished Professor <i>U of T</i> Professor Javad Mostaghimi</p>	<p>Faculty Award <i>U of T</i> Chair David Zingg EngSci 7T9, MASC 8T1, PhD 8T8</p>	<p>Fellow <i>Canadian Academy of Engineering</i> Professor Levente Diosady ChemE 6T6, MASC 6T5, PhD 6T8, Professor Doug Perovic MSE 8T6, MASC 8T8, PhD 9T0, Professor Alex McLean</p>	<p>Fellow <i>Royal Society of Canada</i> Professor Molly Shoichet</p>	<p>IBM Faculty Award <i>IBM</i> Professor Andreas Moshovos</p>	<p>Ontario Professional Engineers Awards <i>Professional Engineers Ontario Management</i> Lloyd McCoomb CivE 6T8, PhD 8T2</p>	<p>Sloan Research Fellowship <i>Sloan Foundation</i> Professor Aaron Wheeler</p>
<p>Canada Medal <i>Society of Chemical Industry</i> Brian Wastle ChemE 6T7</p>	<p>Early Career Teaching Award <i>Faculty of Applied Science and Engineering</i> Professor Hani Naguib PhD 0T1</p>	<p>Faculty Teaching Award <i>Faculty of Applied Science and Engineering</i> Professor Tarek Abdelrahman</p>	<p>Fellow <i>Canadian Institute of Food Science and Technology</i> Professor Levente Diosady ChemE 6T6, MASC 6T5, PhD 6T8</p>	<p>Fellow <i>The American Institute for Medical and Biological Engineering</i> Chair Paul Santerre, Professor Peter Zandstra</p>	<p>International Award <i>Society of Chemical Industry</i> Dr. Larry Seeley ChemE 6T6, MASC 6T8, PhD 7T2</p>	<p>Research and Development Professor Greg Evans ChemE 8T2, MASC 8T4, PhD 8T9, Professor Nazir Kherani EngSci 8T2, MASC 8T3, Professor Javad Mostaghimi, Professor Chul Park</p>	<p>Space Flight Awareness Honoree Award <i>NASA</i> Sean Dowling Meng MEng 0T4</p>
<p>Canada Research Chair (CRC) Professor Andreas Mandelis, Professor Yu Sun</p>	<p>Engineers Canada Gold Medal <i>Engineering Canada</i> Morden Yolles CivE 4T8</p>	<p>Fellow <i>American Association for the Advancement of Science</i> Professor Grant Allen ChemE 8T1, MASC 8T3, Professor Brendan Frey PhD 9T7, Professor Emeritus Mary Jane Phillips ChemE 5T3, Professor Christopher Yip ChemE 8T8</p>	<p>Fellow <i>Canadian Society for Mechanical Engineering</i> Professor Yu Sun</p>	<p>Fellow <i>University of Tokyo School of Engineering</i> Professor Javad Mostaghimi</p>	<p>Jules Stachiewicz Medal <i>Canadian Society for Mechanical Engineering</i> Professor Charles Ward</p>	<p>Young Engineer Medal Dwayne Shirley MSE 0T1, MASC 0T3, PhD 0T9</p>	<p>TATP Teaching Excellence Award <i>Teaching Assistants' Training Program (TATP)</i> Vinod Muthusamy MASC 0T5</p>
<p>Canadian Metals Chemistry Award <i>Canadian Institute of Mining, Metallurgy and Petroleum</i> Stavros Argyropoulos</p>	<p>Engineers Canada Medal of Distinction in Engineering Education <i>Engineering Canada</i> Professor Susan McCahan</p>	<p>Fellow <i>Chemical Institute of Canada</i> Graeme Norval ChemE 8T3, MASC 8T5, PhD 8T9</p>	<p>Fellow <i>Chemical Institute of Canada</i> Graeme Norval ChemE 8T3, MASC 8T5, PhD 8T9</p>	<p>Fred Beamish Award <i>Canadian Society for Chemistry</i> Professor Aaron Wheeler</p>	<p>Kalev Pugi Award <i>Society of Chemical Industry</i> Dr. Stephen Dunn ChemE 6T7, MASC 6T9, PhD 7T1</p>	<p>Paper Industry International Hall of Fame <i>The Paper Industry</i> Professor Doug Reeve MASC 6T9, PhD 7T1</p>	<p>Top 35 Young Innovators Under 35 <i>MIT's Technology Review</i> Professor Milica Radisic</p>
<p>Canadian Metal Physics Medal <i>Canadian Institute of Mining, Metallurgy and Petroleum</i> Professor Doug Perovic MSE 8T6, MASC 8T8, PhD 9T0</p>	<p>E.W.R. Steacie Fellowship <i>NSERC</i> Professor Brendan Frey PhD 9T7</p>	<p>Fellow <i>American Society of Mechanical Engineers</i> Professor Shaker Meguid</p>	<p>Fellow <i>Engineering Institute of Canada</i> Professor Barry Adams, Professor Michael Collins, Professor Mark Fox, Professor Jim Wallace</p>	<p>George Warren Fuller Award <i>Ontario Water Works Association</i> Professor Bob Andrews</p>	<p>Medal for Outstanding Achievement in Industrial and Applied Physics <i>Canadian Association of Physicists</i> Professor Andreas Mandelis</p>	<p>Order of Honour <i>Professional Engineers Ontario</i> Kenneth Lopez CivE 5T5, MASC 5T9</p> <p>Robert W. Angus Medal <i>Canadian Society for Mechanical Engineering</i> Professor Chul Park</p>	<p>Woman Engineer Award <i>ASME Electronic and Photonic Packaging Division</i> Dean Cristina Amon</p> <p>Yeram S. Touloukian Award <i>American Society of Mechanical Engineers</i> Professor Andreas Mandelis</p>
<p>Carolyn Tuohy Impact on Public Policy Award <i>U of T</i> Chair Doug Reeve MASC 6T9, PhD 7T1</p>	<p>Excellence in Clinical Engineering Leadership Award <i>American College of Clinical Engineering</i> Professor Tony Easty</p>	<p>Fellow <i>Association for Computing Machinery</i> Professor Jonathan Rose ECE 8T0, MASC 8T2, PhD 8T6</p>	<p>Professor Jonathan Rose ECE 8T0, MASC 8T2, PhD 8T6</p>	<p>Gold Mirko Ross Medal <i>Swiss Federal Laboratories for Materials Testing and Research</i> Marie-Anne Erki CivE 8T0, MASC 8T2, PhD 8T8</p>	<p>McCharles Prize for Early Career Research <i>Faculty of Applied Science and Engineering</i> Professor Wei Yu</p>		

- Over the past five years, the number of major awards and honours received by faculty members has risen from eight awards in 2003 to 26 awards in 2008.
- In the past year, we received 30% of all major awards in Canada compared to other Canadian Engineering Faculties.
- Last year, we ranked No. 1 in Canada for total NSERC funding received (\$20.9 million).



Ted Rogers

A Visionary who Inspired Greatness in Others

were sold. However, his son was determined to carry on his father's legacy.

Born in Toronto, Ted was educated at Upper Canada College. He graduated from Trinity College at the University of Toronto in 1956 with a Bachelor of Arts. Only four years after finishing his degree, Ted bought CHFI-FM. This purchase formally kick-started his career in broadcasting. In 1962, Ted formed Rogers Broadcasting Limited after acquiring CFHI-AM (now known as 680News). In 1967, Ted led Rogers into the cable industry and was awarded television licenses in Toronto, Brampton and Leamington. By the 1970s, Rogers Cable Television became recognized as the nation's most innovative cable company with a multi-cultural clientele and inter-

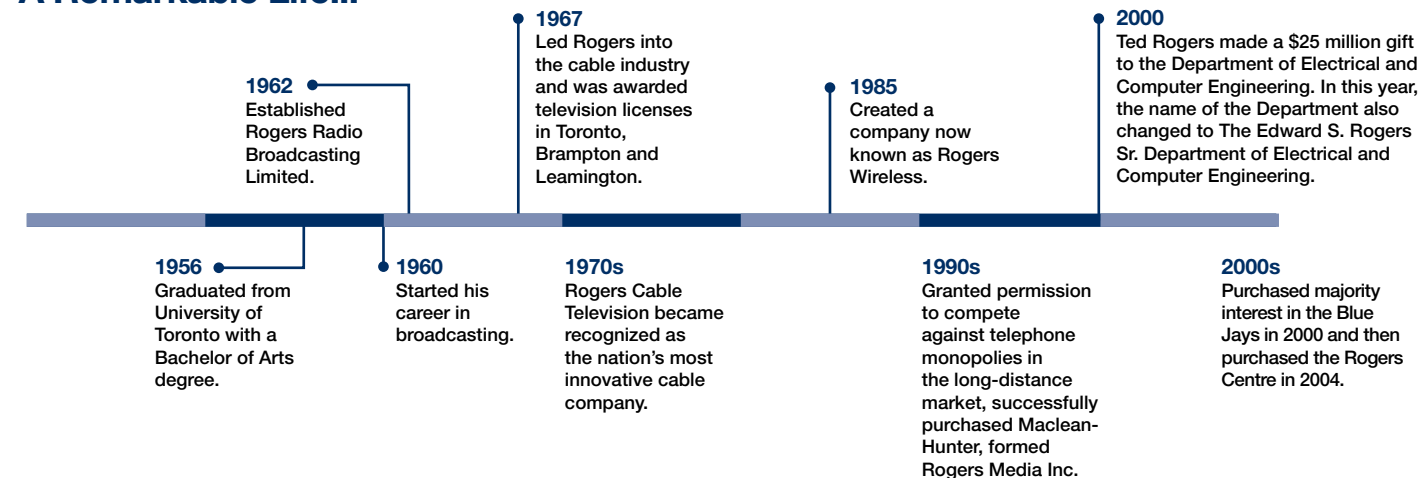
ests spread throughout the country. In 1985, Ted foresaw the future of mobile phones and created a company now known as Rogers Wireless. In the 1990s, Ted was granted permission to compete against telephone monopolies in the long-distance market and successfully purchased Maclean-Hunter, which together with the company's radio and television operations, form Rogers Media Inc.

Ted's accomplishments are plentiful, diverse, and exceptional. What stands out the most to the Faculty, however, is Ted's contribution to Skule™. Through the Edward S. "Ted" Rogers Fellowships and the Edward S. Rogers Sr. Graduate Scholarships we have been able to recruit and sustain an outstanding group of talent, many of whom have taken up posts in prominent

Edward S. Rogers Sr. invented the world's first alternating current radio tube, which enabled radios to be powered by ordinary household electric current. In 1931, Edward was

awarded an experimental television license in Canada. However, on May 6, 1939 he passed away suddenly at the young age of 38. He left behind a widow and a five-year-old son by the name of Ted. His business interests

A Remarkable Life...



universities, as well as the public and private sector. In addition, the Edward S. Rogers Sr. Admissions Scholarships continues to attract outstanding undergraduates to Skule™ and supplies them with a strong global platform.

Deep sadness was felt throughout the Faculty with news of Ted's passing on December 2, 2008. Skule™ will forever remember his innovations and contributions. Ted is one of few people who truly left the world in a better state. Not only was Ted an ambitious, and prosperous business leader, he was also an equally successful leader in terms of grace and generosity.

Past Fellowship and Scholarship Recipients

"The Scholarship was instrumental in my decision to attend the University of Toronto. My opinion was pretty divided between two high caliber schools, but it was the additional financial incentive that made me choose U of T. The award was also a motivator in school, as it provided an immediate reason to succeed. Thanks to that support, I can now apply the skills I learnt to the career I have today."

Eugene Lam ECE 0T5

"The Scholarship was one of the highlights of my education. As a new immigrant who didn't have

a lot of money, the Scholarship not only alleviated any kind of financial burden but it also helped me make up my mind about attending U of T. I graduated in 2006 and am now working as a controls engineer at Atomic Energy of Canada Ltd. I am so grateful for all the support I have received. I never felt alone and I knew I could always go to someone for support. I am absolutely inspired to start my own scholarship at U of T one day to help bright students focus their minds while not having to worry about how they're going to finance their education."

Sushma Narisetty ECE 0T6

"The impact of the graduate scholarships has been enormous,

as it allows our graduate students to do more creative research. The creativity of these students is crucial to our success."

Chair **Jonathan Rose** ECE 8T0, MASc 8T2, PhD 8T6

"I was a proud recipient of the Fellowship. It granted me peace of mind to focus on my PhD work, as I didn't have to worry about my finances — a problem that many international students face."

Amirnaser Yazdani PhD 0T5

"Without the Fellowship, I wouldn't have been able to stay long enough at U of T to finish my research and write my thesis that led to a fantastic job offer."

Kamran Farhadi MASc 0T5

In Memoriam

It is with regret that we have learned of the passing of the following Skule™ graduates between April 2008 and April 2009:

Nicola Bada
CivE 7T7
12/7/53 to 12/6/08

Professor **Alfred Bernhart**
Passed away on 6/28/08

Charles Cross Bigelow
ChemE 5T3
4/25/28 to 11/25/08

S. Donald Bruce Black
ChemE 5T3
4/10/31 to 7/5/08

Robert "Bud" Leslie Broad
ChemE 3T6
12/3/11 to 1/22/09

Maurice (Mort) Brown
Mining 3T8
11/11/12 to 6/24/08

Huntley Henderson Bush
ECE 5T0
9/18/26 to 6/14/08

Kenneth R. Crean
MIE 5T3
10/16/30 to 11/28/08

John Jay Cunningham Jr.
MIE 7T4
10/24/52 to 4/6/09

Professor **Luis de Windt**
Passed away on 6/21/08

Art Douloff
EngPhys 5T8
5/23/36 to 9/15/08

Alfred Eric "Bud" Downing
ChemE 4T7
2/28/23 to 2/4/08

Keith G. Dunlop
ChemE 5T2
1/17/29 to 1/13/08

Gordon Ezra
CivE lab demonstrator
Passed away on 10/1/08

James Douglas Ford
ChemE 6T7
10/10/31 to 2/3/08

Wilfred Frank Fromm
ECE 4T9
7/6/20 to 5/14/08

John Roberts Fydel
ECE 5T7
10/17/24 to 9/6/08

Leon Gasner
MIE 5T2
1/31/30 to 4/5/08

Hugh Raymond Green
ChemE 4T0
5/27/15 to 8/25/08

Howard Grittani
MIE 4T9
9/24/23 to 7/11/08

Roland Hilken
Mining 6T3
8/17/35 to 4/20/08

Ian L. Jennings
Mining 3T8
8/31/15 to 7/31/08

Kenneth R. Johns
CivE 5T0
1/29/18 to 11/8/08

Professor **Cameron Kenney**
Passed away on 8/19/08

Arthur Klarman
EngPhys 4T7
Passed away on 4/20/09

Jacob Leidner
ChemE 7T2
10/27/46 to 2/22/08

John Burke Mitchell
Metallurgy 4T3
11/13/21 to 3/12/09

Raja (Roger) Amitava Mukherjee
CivE 8T7
Passed away on 8/11/08

John William Patterson
Geological 4T9
5/14/21 to 1/20/09

Paul F. Phelan
MIE 5T4
8/16/31 to 10/20/08

Harvey McGregor Reid
ECE 4T0
3/19/17 to 3/22/08

Charles Alfred Sankey
ChemE 2T7
7/31/1905 to 4/29/09

Bella Tiefenbach
ChemE lab demonstrator
5/1/22 to 11/7/08

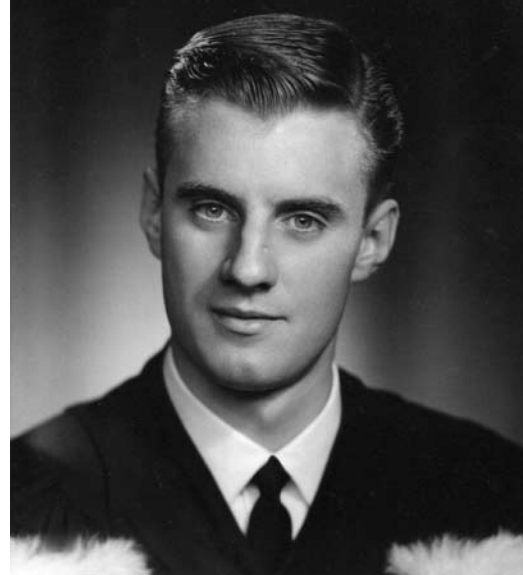
Donald Keith Turner
CivE 5T2
11/15/28 to 1/31/09

Bert Turvolgyi
ChemE 5T3
10/20/24 to 1/25/09

G. Leslie Wilson
CivE 5T1
1/5/24 to 9/4/08



Barry Levine (MIE 8T4)



Alec Monro (ChemE 5T9)

Class Leaders Showing Continued Leadership

There is no limit to the positive change Class Leaders produce for Skule™. For 135 years, Class Leaders such as **Barry Levine** (MIE 8T4) and **Alec Monro** (ChemE 5T9) convey ideas that fuel improvements. Today, Skule™ is recognized as Canada's No. 1 Engineering educator and has entered the world's top 10 standing. This accomplishment is attributable to the dedication of the Faculty's global family, which includes our committed Class Leaders. Recently, Levine and Monro shared their experience and journey with us, and their reasons for staying actively involved with the Faculty:

What extracurricular activities were you involved in when you were a student?

Levine: I was involved as a Class Leader from the start, but also became actively involved in the undergraduate Engineering Society as treasurer and later as communications chair.

Monro: Throughout my undergraduate experience at Skule™, I was chair of Chem Club and a member of the Phi Kappa Sigma fraternity. The fraternity, at that time, had a high percentage of Engineering undergrads as members. During my First Year, I was also part of the Skule™ Nite cast.

Is there one experience at Skule™ that had an impact on your life after Skule™?

Levine: Definitely all of the extracurricular involvement had a huge impact. I've continued

to be involved in alumni matters for 25 years now.

Monro: I would say the class trips visiting major industry players across Ontario played a huge impact on my life after Skule™. Not only were these trips educational, but they also provided my classmates and I with an opportunity to strengthen our social interaction skills and confidence. I was never a shy person, but it can always be difficult to find your voice in a large group. The field trips forced all of us to come out of our shells even more.

Who was your mentor at Skule™? Tell us about this relationship and why it was valuable.

Levine: I'm not sure if there was one mentor per se during my undergraduate years. I surrounded myself with other leaders active in student life.

They all shared a passion for getting involved in something outside of just going to classes.

Monro: One of my fraternity brothers, **Ron Kerr** (ChemE 5T6), played a huge role in my experience at Skule™. If it wasn't for him, I would never have gotten involved the way I did. Towards the end of my undergraduate experience, a few professors influenced me greatly as well. Their knowledge and passion for the material they taught was inspirational and motivated me to want to learn more, as well as do more.

Why did you volunteer as a Skule™ Class Leader?

Levine: It was an easy way to transition my involvement after Skule™.

Monro: It was a natural evolution. I was heavily involved in

student politics in high school and wanted to get involved with Skule™ on a similar level. I like to see results and make things happen. Being a Class Leader was a great way to get the shared voice of my class heard and acknowledged. In fact, it's still an amazing venue to express the opinions and thoughts of my class.

Did you make friends at Skule™ who are still friends today?

Levine: Yes. I actually have a group of friends from Skule™ who I see on a fairly regular basis. These are people I consider friends for life.

Monro: I can say in all honesty that my closest friends today are the ones I made through Skule™. It's remarkable how we still motivate each other to take action long after graduation. Together we have raised enough money to

successfully fund the Class of 5T9 Leadership Award, which is given each year to a student in Third Year. The Award recognizes students making a difference to the Faculty, University, and community at large.

What role do you see yourself, or others in your position, playing in promoting Skule™?

Levine: It's important for the students to realize that just going to classes doesn't differentiate you when you hit the job market. It's important to be well-rounded as an individual, and getting involved as a leader is one way to expand one's horizons and hone non-technical skills that are necessary for business and life in general.

Monro: As Skule™ alumni we have a duty to make sure current Skule™ students understand the importance of looking to the future and the missions they wish to achieve. It is their actions in the present that determine who they truly become in the future. Our goal as alumni is to help create global engineers.

What is the first thing that comes to mind when you think of Skule™?

Levine: Having been so involved for so long, there are many things that come to mind. However, the student experience and strong Skule™ traditions stand out.

Monro: The first thing that comes to my mind is the interesting and stimulating faculty at Skule™ and how they make a person want to achieve more. I wasn't a great student until my last year in Skule™. The structure and organization provided by my professors carried over to the way I managed the activities in my own life. They helped me, and I'm sure many others, develop important characteristics essential for success.

What is the first thing you'd like to come to mind when others think of Skule™?

Levine: That the Engineering education and opportunity to develop leadership skills are second to none.

Monro: Skule™ provides a depth of knowledge and education. In many ways it now

"University is more than attending lectures and labs. There's so much more to Skule™ life than bookwork. The key is realizing this in time to truly benefit from it. Class Leaders are all aware of this fact."

Thomas Medland, EngBus 4T9



provides a much broader education. When I was in Skule™ we didn't have any electives. Skule™ students now are well versed on many different areas and are well on their way to becoming exceptional global engineers.

What's one thing you haven't accomplished yet that you look forward to in the future?

Levine: When I "retire" I'd like to do something completely different. I'm just not sure what that is yet. In the meantime, I see every project — whether in business or just something around the house

— as a personal accomplishment.

Monro: On the professional side, I really want to use my leadership skills to help further extend awareness around the Engineering LOT program, as well as Wildlife Preservation Canada, an organization that I participate in. For both, I'd like to help establish a wider base of support and donors and help recognize people who are making a real difference. On the personal side, my wife and I enjoy traveling and learning about different cultures. This is something I look forward to continuing.

Calling Class Leaders from Classes ending in 5 or 0!

Class Leaders are elected student and alumni dedicated to strengthening ties between Skule™ and the University by acknowledging and reinforcing the importance of class affiliation. This group works closely with the Advancement Office to ensure that classes have active-engaged leadership, and to promote and facilitate communication.

If you're a Class Leader from a class ending in 5 or 0, we need your help in planning next year's Spring Reunion. Why should your classmates participate in Spring Reunion next year?

"It's a great way to rekindle some old friendships and see what

everyone is up to," says **Barry Levine** (MIE 8T4).

"For the members of my class, we're at a stage in life where if you remember with fondness your time at Skule™ this is an opportunity where you can reflect on it with old friends. Sadly, some of us have passed since graduating in 5T9. Spring Reunion allows the members of my class to appreciate each other and the amazing company we made while at Skule™," explains **Alec Monro** (ChemE 5T9).

Read more about Class Leaders Levine and Monro in the above story, *Class Leaders Showing Continued Leadership*.



CLASS LEADERS FROM LEFT TO RIGHT: Thomas Medland (EngBus 4T9), Barry Levine (MIE 8T4), Bob MacCallum (ECE 6T9), Sonia De Buglio (ChemE 9T4), Don Andrews (CivE 5T4), Paul Cummings (EngBus 5T4), Alec Monro (ChemE 5T9), Frank Squires (ECE 4T9), Gordon Schmidt (MIE 4T9), and Sid Olvet (ChemE 5T9).

Want to Learn More?

Visit www.alumni.utoronto.ca/engclassleaders or contact Mary Butera at 416-978-4941 or butera@ecf.utoronto.ca.

Department of Chemical Engineering and Applied Chemistry

Engineering a Better Future for Ethiopia



Professor Yu-Ling Cheng

In June 2008, Addis Abba University (AAU) invited members of the international academic community to its Akaki Campus to share in their new goal to strengthen the overall higher education capacity of the country. Professor **Yu-Ling Cheng**, along with 12 other U of T faculty, traveled over 11,000 km to attend the International Workshop on PhD Programs to support AAU's mission to expand its graduate education and research capacity.

There's a growing recogni-



tion in the global community that educational aid is important and university education is paramount. Professor Cheng remarked, "At the AAU workshop, there was a sense of history being made, and everyone from the Toronto delegation felt privileged to be present. AAU is asking for help in nearly every discipline in Engineering."

Better Biofuel

Consumers frustrated with gas prices and carbon emissions may soon have a viable alternative to petroleum-based fuel, thanks in part to research underway at the Department. Professor **Emma Master** is one of several researchers in the Department currently studying biofuel, which can be used for

automotive transportation at lower economic and environmental costs.

While global interest in biofuels is on the rise, concerns about their impact on food supplies and biodiversity, as well as their cost as compared to fossil fuels such as oil, have prompted researchers like Master to focus on second-gener-

ation biofuels. Produced from biomass composed of such materials as the non-consumable portions of food crops, as well as crops not used for food purposes and agricultural and industrial waste, second-generation biofuels are more sustainable, affordable and beneficial for the environment.



Professor Emma Master

NEW FACULTY



Assistant Professor **Alison McGuigan** (PhD 0T5) is interested in

how to design, organize and assemble living biological materials such as tissues. Her research combines both engineering and developmental biology principles and will include the creation of tools and strategies to organize living materials and developing quantitative models to describe the design and assembly process of living materials.

Three Chemical Engineering Professors Named AAAS Fellows

Professor Emeritus **M. Jane Phillips** (ChemE 5T5), and Professors **Grant Allen** (ChemE 8T1, MASc 8T3) and **Christopher Yip** (ChemE 8T8) have been elected Fellows of the American Asso-

ciation for the Advancement of Science (AAAS), the largest international organization dedicated to advancing science or its applications on a global basis. This singular honour recognizes their

outstanding efforts in furthering the objectives of AAAS. The Department received three of the 37 Fellowships awarded in the Engineering Section, more than any other single institution.



Department of Civil Engineering

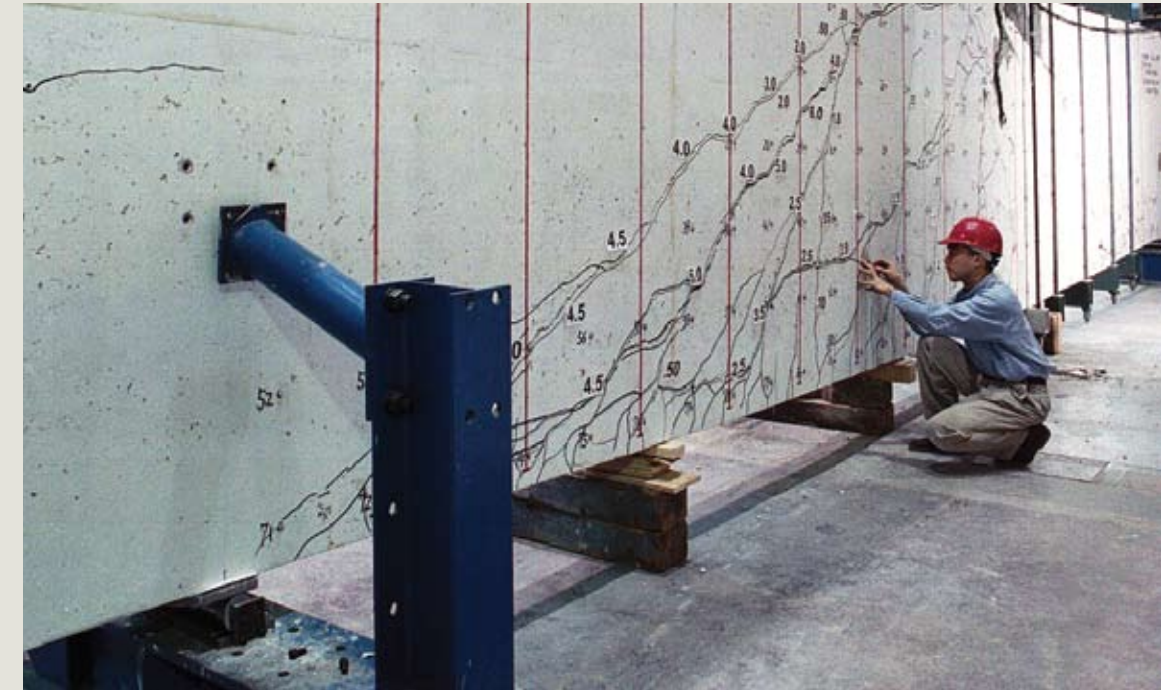
New Structures Facility

Final touches in the multi-million-dollar Structural Testing Facilities upgrade is now complete, thanks to a large grant awarded to **Professors Jeffrey Packer and Constantine Christopoulos** by the Natural Sciences and Engineering Research Council of Canada (NSERC).

The enhanced labs are much larger, and now equipped with a state-of-the-art cooling tower, electrical room, receiving dock, and pumping system. The new hydraulic system will see capacity rise from 40gpm (gallons per minute) to 360gpm, an increase of about nine times.

These upgrades will allow larger and more frequent tests, ensuring our continued place as a world-class research facility.

To support the Structural



Testing Facility's recent enhancements, contact the Advancement Office at engineering.advancement@utoronto.ca.

ABOVE Concrete Failure Testing in the Huggins Structures Lab.

Sustainability Initiative Brings Global Focus to Civil Engineering

In response to growing worldwide awareness of the vital need to protect our environment while sustaining human development, Civil Engineering has launched a long-term plan that will result in the largest change to its curriculum. While maintaining the solid theoretical core that defines the field of civil engineering, the new "Sustainability Initiative" will see

undergraduate students exposed to larger principles of sustainability and responsible civil development in every facet of their studies. New courses focus on topics such as Sustainable Energy Systems, Infrastructure for Sustainable Cities, and Sustainable Buildings, while traditionally offered courses, such as Building Science, are being re-tooled to en-

sure they cover the world's best practices.

At a time when politicians, business leaders, and consumers alike are demanding action on environmental problems, the Sustainability Initiative is ensuring the next generation of civil engineers will be armed with the best possible framework for solving the world's problems.

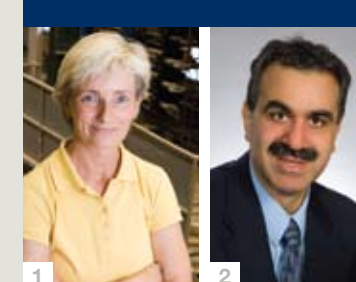
Revitalizing Survey Camp

A Master Plan is currently being created that will help preserve and enhance the Gull Lake Survey Camp for future generations. If you would like to be involved in the development initiatives at Gull Lake, please contact Nelly Pietropaolo at 416-978-0235 or nelly@civ.utoronto.ca.



Civilian Now Online

If you haven't received your copy of Civilian, all issues are now posted online at: www.civil.engineering.utoronto.ca/infoabout/news/civilian.htm.



1 Associate Professor **Susan Andrews'** research is concerned with the optimization of water treatment processes, especially in the area of drinking water disinfection.

2 Professor **John Hadjigeorgiou's** teaching, research, and consulting activities are in the areas of rock characterization, reinforcement and support, and mine design.

The Edward S. Rogers Sr. Department of Electrical and Computer Engineering



LEFT Professor Nazir Kherani (center) discusses photovoltaic device fabrication with doctoral graduate students.

crystalline silicon heterojunction device) with initial efficiencies approaching double digits; in due course the performance is expected to exceed 20%.

Also significant is the quest of high efficiency heterojunction silicon photovoltaics. An important feature is the attainment of high effective minority carrier lifetime. Professor Kherani's research team has recently produced amorphous-crystalline silicon interfaces yielding lifetime in the 7 ms range, one of the highest values reported for amorphous silicon. In the matter

of researching the integration of photonic crystals and photovoltaics, the group has collaboratively developed a new photonic crystal composite that provides for spectral tuning of light, which has potential for high efficiency tandem thin film photovoltaics.

In addition, the team has made progress in the area of high efficiency thin silicon (2-10 micron) photovoltaics with a theoretical investigation of a 2D photonic crystal architecture indicating very high-energy conversion performance.

Professor Kherani's quest is to help drive the progress of solar power as a cost effective source of reliable, sustainable electricity worldwide.

Sustainable Electricity

Imagine a world in which even the most remote village has access to renewable and affordable energy. Many believe that such a world is possible and that solar power is one of the means by which it can be achieved. Experts believe that by the year 2020 solar power could deliver electricity to more than one billion people; and that by the year 2040 it could support the electricity needs of more than one fifth of the world's population.

"Solar energy stands to become a dominant part of the global energy mix. The biggest challenge in taking solar electricity mainstream is cost per watt," says Professor Nazir Kherani (EngSci 8T2, MASc 8T3) from The Edward

S. Rogers Sr. Department of Electrical and Computer Engineering.

The objective of Professor Kherani's research and development program is to reduce the cost per watt of solar electricity by means of high efficiency silicon photovoltaics. Photovoltaic is the direct conversion of solar energy into electricity. Conversion is done through a photovoltaic device or solar cell.

There are a number of areas in which Kherani feels his research team has made significant progress. In the investigation of advanced cell concepts, the team has proposed and demonstrated the proof of principle of the BACH solar cell (the back amorphous

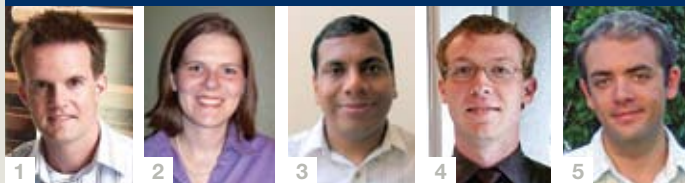
Professor Frey Named AAAS Fellow

The American Association for the Advancement of Science (AAAS), the largest international organization dedicated to advancing science or its applications on a global basis, has named Professor Brendan Frey (PhD 9T7) a Fellow for his distinguished contributions to the field of information processing and machine learning and to genomics research.



Professor Brendan Frey (bottom left) discussing research ideas with his graduate students and postdoctoral fellows.

NEW FACULTY



1 Assistant Professor **Jason Anderson** (MASc 9T7, PhD 0T5) focuses his research on developing ways to make Field Programmable Gate Arrays more energy-efficient, faster and easier to use.

2 Assistant Professor **Natalie Enright Jerger** directs her research around computer architectures to discover methods to optimize communication between processing cores and memory.

3 Assistant Professor **Ashish Khisti** (EngSci 0T2) pursues solutions to issues surrounding transmission and security of information and wireless communications and multimedia systems.

4 Assistant Professor **Joseph "Zeb" Tate** is particularly interested in improving the reliability of the power grid by

leveraging new metering and processor technologies.

5 Assistant Professor **Olivier Trescases** (BASc 0T2, MASc 0T4, PhD 0T7) is working to develop flexible power management strategies for automotive integrated circuits. His past research includes motor drives for hybrid electric vehicles.

Division of Engineering Science



Award Celebration

Pictures shown are from the Division of Engineering Science's inaugural Award Celebration held December 2, 2008. This special event was held in order to recognize the dedication and support of EngSci's

ABOVE Nykolai Bilaniuk 8T5 and Glynn Williams 7T8; RIGHT Boris Stoicheff 4T7 and Mary Ruggiero 7T7.

alumni and friends and to honour some of our current students who have benefited directly from their financial support.



New Electrical and Computer Option

The Electrical Option in Engineering Science has stood the test of time and has been part of EngSci since the program began in the mid-1930s. It was originally known as the Electricity and Communications Option and in 1949 became the Electrical Option.

A Computer Science Option was implemented in 1968 and evolved into a Computer Engineering Option in the late 1980s. Both the Electrical Option and the Computer Option exist today and continue to be popular among EngSci students.

In 2007, a committee was struck by The Edward S. Rogers Sr. Department of Electrical and Computer Engineering (ECE) to develop the curriculum for a new, merged **Electrical and Computer Engineering Option** for the following reasons:

Students coming out of First and Second Year Engineering Science curriculum have had less

formal exposure to different areas within ECE than students in the core Electrical and Computer Engineering programs, making it difficult for them to understand the implications of having to take possibly overly specialized course selections in Third Year;

Engineering Science students tend to have greater "bandwidth" than students in the core programs, allowing them to handle a greater diversity of subjects;

Making a merged Electrical and Computer Engineering Option gives EngSci a new Option that has a greater degree of distinctiveness from the core programs.

Four new courses are being developed for students pursuing this new Option in fall 2009 — Energy Systems, Systems Software, Foundations of Computing, and Digital Signal Processing. Students graduating from this new Option will receive their major in Electrical and Computer Engineering.

Engineering Now Offers Two Undergraduate Degrees

Starting this June the Faculty will be granting two distinct undergraduate degrees to its graduates — the traditional BASc and a new **BASc in Engineering Science**.

"The new degree retains an important connection with the traditional BASc degree," says Professor **Will Cluett**, Chair of the Division of Engineering Science. "Our students were unanimous in their wish to see some sort of recognition to distinguish their degree, but at the same time they wanted to retain the historical connection. We felt that the renaming of the degree to include 'Engineering Science' would best accomplish this goal."

The Faculty believes that there will be many benefits to making it clear that it offers two distinct undergraduate degree programs. "Our Faculty is one of a very small number of schools in the world to offer a full slate of high quality En-

gineering programs in addition to a truly distinct Engineering Science program, and this is something we should celebrate," adds Cluett.

EngSci students who are currently enrolled will have the choice of receiving either the BASc or the BASc in Engineering Science on their diploma.

Our Faculty is one of a very small number of schools in the world to offer a full slate of high quality Engineering programs in addition to a truly distinct Engineering Science program, and this is something we should celebrate.

Will Cluett, Chair

Division of Environmental Engineering and Energy Systems



Message from Chair Bryan Karney

It has been a time of exciting growth at the Division. In September we rolled out the first cohort of the new Engineering Science Energy Systems Option. These first 15 students have been enthusiastic about, and made great contributions to the new Third Year program. And word on the street is that Energy Systems is exciting and attractive to the current Second Year students selecting their Option. We're looking forward to welcoming our second cohort of students in September.

But even more change is underway! In January, the Faculty introduced two new minors for

undergraduate Engineering students: a minor in Environmental Engineering and a minor in Sustainable Energy.

The minor in **Environmental Engineering** replaces the 13-year-old Collaborative Option in Environmental Engineering, which was only available to Civil and Chemical Engineering students. This option has remained popular over the years, with typically 40 new students each year. With the new minor, the Faculty has expanded the availability of the environmental courses to include almost all Departments.

There is a strong sense the new notation "Completed a Minor in Environmental Engineering" will be easier for employers to recognize and for students to promote than the somewhat am-

biguous "collaborative" name we have been using.

Concepts covered in courses for the minor include ecology, sustainable design, risk assessment, and environmental impact. Our definition of Environmental Engineering is broad, reaching to

In January, the Faculty introduced two new minors for undergraduates:

- Environmental Engineering
- Sustainable Energy

all areas at the interface of engineering and the environment. This includes ecological impact, waste management, water and wastewater treatment, environmental microbiology, water resources engineering, hydrology, preventive engineering, life cycle analysis, design for the environment, and extends to the social and environmental impacts of technology.

The minor in **Sustainable Energy** puts a broad emphasis on the production and use of energy and what engineers can do to better account and accommodate sustainability. It is also available to almost all Departments. Students will focus on concepts such as thermodynamics, the sustainable use of energy, energy demand management, and the public policy context in which energy use and production is regulated.

Our definition of Sustainable Energy is broad, reaching to all areas of energy use, production, distribution, transmission, storage, and development. This includes energy use and production for transportation, for space cooling and heating demands, and electrical production (from both alternative and conventional sources), energy distribution and storage, and extends to energy conservation, price, greenhouse gas production and control, and aspects of public policy.

Students can register for either minor at any time in their program. Current enrollment projections for the coming year are expected to be around 100 for the Environmental Engineering minor and 150 for the Sustainable Energy minor.

All in all, exciting changes for a "greener" future!

Institute of Biomaterials and Biomedical Engineering

IBBME Researchers Leading the Way in Stem Cell Research

IBBME professors **Bill Stanford** and **Peter Zandstra** are principals among a consortium of top world researchers investigating an array of aspects related to stem cell science.

Last October, Stanford successfully brokered a collaborative partnership with Dr. Shinya Yamanaka and his team of researchers at Kyoto University. Yamanaka's team is the group responsible for pioneering induced pluripotent stem cells, or iPS cells as they are commonly known. iPS cells are stem cells that are generated by coaxing normal human skin cells to act like embryonic stem cells, which renders them capable of mimicking any type of cell tissue.

Many scientists and medical researchers argue that stem cells have the potential to become the single most effective tool medicine has encountered to date. Now that the stigma and ethical concerns that once hampered stem cell research have been eliminated through the iPS approach, the opportunity to explore the possibilities and applications for stem cell therapy is wide open.

One of the new directions that the technology used to generate iPS cells provides is investigating the mechanisms of human complex diseases through the generation of disease-specific stem cells. For instance, stem cells may be used therapeutically to provide an endless supply of new cells to repair tissue damage in degenerative diseases such as Alzheimer's or Parkinson's disease, or in the treatment of other human diseases such as diabetes. Further research may one day lead to cures for heart disease and cancer. In addition, disease-specific iPS cells

could be used to identify new drugs to treat these diseases.

Importantly, iPS cell technology is expected to overcome some of the affiliated challenges associated with stem cell therapy, such as tissue rejection, by opening up the possibility of personalized stem cell treatments tailored for a patient using their own cells (autologous treatments), effectively removing the problems of tissue rejection and perhaps other side effects.

The Toronto team of collaborators is one of the few, worldwide, with experience in translating stem cell technologies to clinical therapies.

Melding basic stem cell biology with bioengineering approaches is considered to be the best methodology for this type of research and the Toronto team of collaborators is one of the few, worldwide, with experience in translating stem cell technologies to clinical therapies. During this collaboration with the

Yamanaka research group, they will primarily be involved in the development of new technologies to modulate and control stem cell reprogramming and differentiation, and will serve as a development and validation platform for the pre-clinical translation and high-throughput discovery aspects occurring at partner laboratories at the University Health Network, SickKids, Mount Sinai hospital, McMaster University, the University of Ottawa.

Stanford is an international leader in the efforts to perform genome-wide mutagenesis in mice and has developed novel integrated network approaches to understand the control of pluripotency and differentiation. Dr. Stanford is co-scientific director of the Ontario Human iPS Cell Facility, director of Gene Trap Mutagenesis, Centre for Modeling Human Disease, and Canada Research Chair in Stem Cell Biology and Functional Genomics.

Zandstra, Canada Research Chair in Stem Cell Bioengineering, is a world leader in the development of bioprocesses to produce stem cells and their derivatives, and in developing models to predict stem cell fate. In 2008, he was the recipient of a Guggenheim Fellowship and the McLean Award and was named one of Canada's Top 40 Under 40.



Professor Bill Stanford



Professor Peter Zandstra

NEW FACULTY



1 Assistant Professor **Dawn Kilkenney's** research interest lies in fibroblast growth factors (FGFs) and signaling through FGF receptors.

2 Assistant Professor **Mary Nagai** is involved in understanding basic cellular and molecular level changes that take place during spinal cord injury.

Department of Mechanical and Industrial Engineering

U of T Distinguished Professor



Professor Javad Mostaghimi

Professor **Javad Mostaghimi** has been appointed University of Toronto Distinguished Professor in Plasma Engineering for a five-year term as of January 1, 2009. The prestigious University of Toronto Distinguished Professor terms are limited to no more than 3% of the tenured faculty.

During the term of the Distinguished Professor Award, Professor Mostaghimi proposes to focus on the impact and solidification of metal droplets in thermal spray coating procedures. Increased understanding of the thermal spray process could lead to more effective methods of protecting combustion engines and turbines from heat, improving their thermal efficiency and resulting in substantial savings in fuel and lower emissions of greenhouse gases.

Inaugural Alumni Dinner Well Received

The inaugural Mechanical and Industrial Engineering Alumni Dinner, generously supported by Manulife Financial, was held Friday, March 27, 2009 and met with great success. More than 140 people attended the

event, held in the Great Hall at Hart House. The keynote speaker was Tom Closson (IndE 7T1), president and CEO of the Ontario Hospital Association. We look forward to welcoming more alumni to next year's event scheduled for Saturday, April 10, 2010.

Alumni and Faculty Improving the World

Anne Sado (IndE 7T7) has had a significant impact on many lives by helping to further Ontario on the economic, social and cultural front. Since 2004, Sado has been president of George Brown College, where she is the inspirational and practical leader of initiatives that are transforming the way education is delivered.

Under her leadership, the College is spearheading efforts to: integrate immigrants into the economic mainstream; provide outreach to at-risk communities; build strong partnerships with industry; and advance international and interdisciplinary collaborations.

Her ambitious involvement in the community includes service on federal, provincial and community advisory groups, including as director to the Trillium Health Centre, one of Canada's largest tertiary care community hospitals, and as a former director and president of the YWCA Toronto.

Professor **Andreas Mandelis** is the recipient of the 2009 Yeram S. Touloukian Award, bestowed triennially by the American Society of Mechanical Engineers to recognize outstanding technical contributions in the field of thermophysical properties.



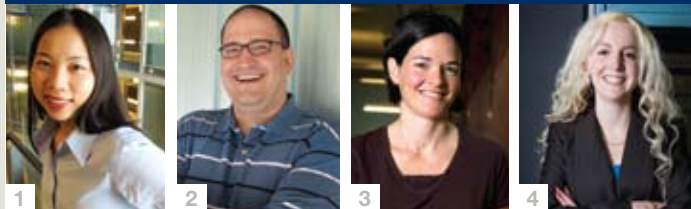
Anne Sado



Professor Andreas Mandelis

Professor Mandelis co-developed photopyroelectric spectroscopy, a thermal wave technique that is now a standard used worldwide in research and practical applications such as food science, semiconductor properties, material science and agricultural, and environmental monitoring. He also pioneered the Thermal-Wave Resonant Cavity, which scientists now use to gain new insights into molecular thermophysics, kinetic theory and the infrared emissivity of fluids.

NEW FACULTY



1 Assistant Professor **Aimy Bazylak's** passion lies in alternative energy. She currently directs the Microscale Energy

Systems Transport Phenomena Laboratory, where her team focuses on water management issues.

2 Lecturer **Jason Bazylak** mentors students in the Sustainable Energy Systems Design course and helps connect undergrads to employers related to this field.

3 Lecturer **Jane Farwell** (MEng 0T7) wants to improve the effectiveness of Engineering learning and to challenge students

to develop practical thinking skills.

4 Assistant Professor **Goldie Nejat** (BASc 0T1, PhD 0T5) directs her research in robotics and mechatronics/biomechanics to develop intelligent assistive robots and devices.

Department of Materials Science and Engineering

Hitachi Installs New Environmental SEM

In partnership with Hitachi High-Technologies Inc., a new state-of-the-art Analytical Variable Pressure Scanning Electron Microscope (SEM) was recently installed in the Department. This microscope is phase one of what the Department plans to develop into a new characterization centre and user facility that focuses on *in situ* processing and analysis techniques. This new installation will allow for dynamic studies of the interplay between materials synthesis, processing, structure, and properties of a wide range of materials systems.

The new centre, to be lead by Professors **Uwe Erb** and **Doug Perovic** (MSE 8T6, MAsc 8T8, PhD 9T0), will be unique in the world and complementary with other Canadian nanotechnology centres and institutes that focus primarily on nanoelectronics, photonics, and nanobiotechnology, particularly, the Canadian Centre for Electron Microscopy (CCEM) established at McMaster University.

LEFT TO RIGHT Catherine Chan (MSE 0T7 + PEY), Sal Boccia, and Josie Barbato using the SEM.



International Connections

A Memorandum of Understanding (MOU) was recently signed to promote inter-university research between our Department and the Department of Materials Processing at Hiroshima University in Japan. The corresponding

Professors are **Tom North** and **Kenji Shinozaki**. This MOU will foster interactive research on friction stir spot welding of Al-alloy and Mg-alloy sheet materials. Two graduate students from Hiroshima University spent one

month during 2008 at Skule™. The Department hopes the interchange of research and students will continue throughout the future.

To date, nine professors from Japan have spent one-year sabbaticals at U of T. This September, Professors Ikuta (Kinki University)

and Takahashi (JWRI, Osaka University) will begin one-year sabbaticals at U of T as well.

Last summer the University of Tokyo hosted a delegation from U of T during the seventh annual UT² Graduate Student Workshop. We look forward to hosting a reciprocal visit this summer.

Ng Joins MSE as Liaison Officer

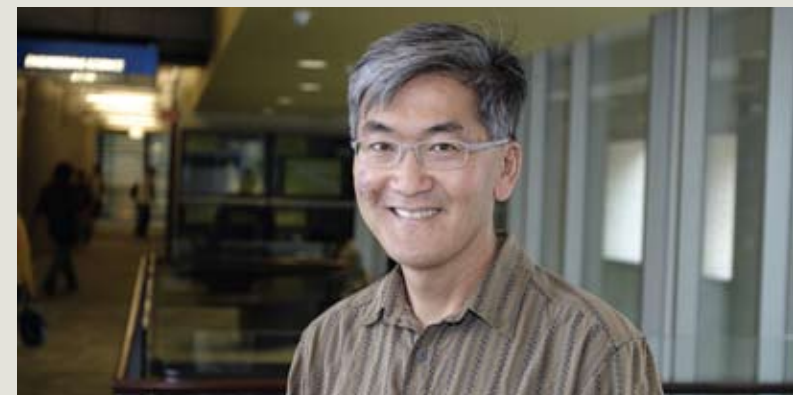
Luke Ng (ChemE 0T7) joined the Department as the new liaison officer, as of February 23, 2009. Luke's portfolio includes alumni and industry relations, as well as student recruitment, communications, and marketing.



Professor Nogami Appointed Chair of Department

Professor **Jun Nogami** (EngSci 8T0) was appointed Chair of the Department of Materials Science and Engineering for a five-year term that commenced January 1, 2009.

"In the appointment of Jun Nogami, we have identified a Chair having both deep roots in Engineering at the University of Toronto and highly-respected international research and teaching experience," says **Cristina Amon**, Dean of the Faculty of Applied Science and Engineering. "His commitment to the University and his accomplishments as a re-



searcher and educator will greatly enhance his leadership of the Department of Materials Science and Engineering."

Nogami obtained his PhD in Applied Physics from Stanford University. He held faculty positions at the University of Wisconsin-Milwaukee, and Michigan

State University, before returning to U of T as a professor. Nogami's research lies in the areas of nanotechnology and electronic materials, with a specialization in atomic resolution microscopy studies.

University of Toronto Institute for Aerospace Studies

Message from Chair David Zingg

“Be proud of our past, be part of our future” is our message to alumni of UTIAS and the Aerospace Option of Engineering Science. In fact it is our message to all members of the extended UTIAS family. The year 2008 gave us many more reasons to be proud of our past and present, such as **Barry French (ChemE**

5T5, PhD 6T2) becoming a member of the Order of Canada — joining **Gordon Patterson (MASc 3T3, PhD 3T5)** and **Ben Etkin (EngSci 4T1, MASc 4T7)** — **Rob Zee (MASc 9T7, PhD 9T7)** receiving the CASI Alouette Award.

Over the past 10 years, UTIAS has undergone a spectacular revitalization. Of the 17 faculty members currently at UTIAS, excluding emeriti, all but four were appoint-

ed in the past decade. As a result of this rejuvenation, UTIAS is buzzing with energy and conducting cutting-edge research in several exciting new directions.

I am delighted to introduce our three newest professors: **Alis Ekmekci, Philippe Lavoie, and Craig Steeves**. All three are setting up world-class experimental facilities with the assistance of the Canadian Foundation for Innovation.

Moreover, all three will contribute to the UTIAS Sustainable Flight Initiative, which aims to reduce the environmental impact of aircraft.

We encourage you to get to know the new UTIAS, which retains our tradition of excellence while pursuing several exciting new initiatives. Please check our website and join our alumni registry for information about our 2010 Industry/Alumni/Student event.



Dr. Tim Barfoot

Exploring Other Worlds

Dr. Tim Barfoot (EngSci 9T7, PhD 0T2), assistant professor at UTIAS and Canada Research Chair in Autonomous Space Robotics, wants to make a big impact on the future of space exploration. His experimental research is focused on the development of guidance, navigation, and control techniques to allow rovers to explore the Moon and Mars autonomously.

With support from the Canadian Space Agency's analogue program, Dr. Barfoot, with co-investigators **Dr. Gordon Osinski (UWO)** and **Dr. Nadeem Ghafoor (MDA Space Missions)**, carried out a preliminary robotic exploration of the Houghton Crater on Devon Island

in the High Arctic, in the summer of 2008. With continued support for Canadian space robotics highlighted in the recent federal budget, Dr. Barfoot and his team plan to return to the Arctic over the next several years to learn how key aspects of field geology can be carried out robotically to support upcoming Lunar and Mars missions.

UTIAS-MITACS Workshop on Aviation and Climate Change

UTIAS organized and hosted the first UTIAS-MITACS International Workshop on Aviation and Climate change on May 29-30, 2008. The workshop brought together the world's leading researchers, including three members of the IPCC, in a wide range of areas related to the quest for technological solutions to reduce greenhouse gas emissions from aviation. Participants were from government, industrial, and academic organizations, including Boeing, Shell, Pratt & Whitney Canada, NASA, Bombardier, Cranfield, Cambridge, MIT, Stanford, the Universities of Michigan and Illinois, the Swedish Defence Research Agency, and, of course, UTIAS. A second workshop will be held in 2010.

NEW FACULTY



1 Alis Ekmekci arrives via Istanbul Technical University, Lehigh University and Purdue University. Her research interests include experimental studies of flow-structure interactions, unsteady separated flows, flow control for drag reduction

and vibration suppression, low Reynolds number aerodynamics, and flow visualization.

2 Philippe Lavoie comes to UTIAS after stops at Queen's, the University of Newcastle, and Imperial College.

His area of research is flow control and turbulence.

3 Craig Steeves' pedigree includes UBC, Cambridge, Princeton, and the University of California at Santa Barbara. The primary purpose of his research is to improve the efficiency and performance of aerospace systems by closely integrating enhanced functionality into lightweight structural systems.

Skule™ Events Calendar

Skule™ Mentorship Program Info Session Wednesday, September 16, 2009

Galbraith Building, 35 St. George St., Room 202
6:00pm-7:00pm

Learn how you can help students pursue appropriate career paths that make a world of difference and strengthen their confidence in the process.

Engineering Alumni Association Awards Ceremony

Thursday, November 5, 2009

Hart House, 7 Hart House Circle, Great Hall
6:00pm Reception / 7:00pm Dinner

U of T Engineering enjoys a reputation of being Canada's leading Engineering program thanks to the efforts of the alumni, faculty, staff and students who make up our community. Each year the Engineering Alumni Association recognizes the contributions of our outstanding community members with its annual Awards.

Skule™ Mentorship Program Career Nite Tuesday, January 19, 2010

Galbraith Building, 35 St. George St., Room 202
6:00pm-8:00pm

Take part in an evening of networking filled with alumni speakers who will provide insightful industry experience to students and guests.

Are you an Engineer with an interest in Business and Entrepreneurship? Do you want to meet Engineering alumni working in this field? If yes, then save the date:

Tuesday, September 22, 2009

SHAMBA Foundation,
48 Yonge St., Suite 1200

For more information, contact Lindsay Tarvit at 416-978-7270 or lindsay@ecf.utoronto.ca.

Attention Class of 3T5, 4T0, 4T5, 5T0, 5T5, 6T0, 6T5, 7T0, 7T5, 8T0, and 8T5. Save the date for Spring Reunion May 27 to May 31, 2010

If you'd like to become a Class Leader to help out, contact Mary Butera at 416-978-4941 or butera@ecf.utoronto.ca.

Visit us at www.alumni.utoronto.ca/engineering to learn about the latest events and opportunities to catch up with Skule™.

These are the locations, as shown on the cover, where many Skule™ alumni are living and/or students are from. Listed in the order as they appear on the cover from left to right:

U.S.	Chile	France	Nicaragua	Costa Rica	Cayman Islands
Canada	Venezuela	Morocco	North Korea	Panama	Cyprus
Russia	Pakistan	Kenya	Guyana	Ireland	Egypt
Australia	Peru	Spain	Cuba	Austria	Grenada
India	United Republic of	New Zealand	Eritrea	Rwanda	Guatemala
Brazil	Tanzania	England	Greece	Sri Lanka	Hong Kong
Argentina	Colombia	Scotland	Croatia	Estonia	Iraq
China	Niger	United Kingdom	Slovakia	Portugal	Jordan
Indonesia	Italy	Oman	Albania	Serbia & Montenegro	Macau
Iran	Japan	Germany	Macedonia	South Korea	Malta
Mexico	Thailand	Romania	Lebanon	United Arab Emirates	Mauritius
Algeria	Norway	Nepal	Israel	Lithuania	Palestine
Saudi Arabia	Turkey	Poland	Kuwait		Qatar
Kazakhstan	Nigeria	Tunisia	Switzerland	Other locations where we have presence include:	Republic of Moldova
Libya	Sweden	Bangladesh	Netherlands	Bahrain	Singapore
South Africa	Finland	Ecuador	Belgium	Barbados	St. Lucia
		Philippines	Denmark	Botswana	Sudan
		Ghana	Dominican Republic	Brunei Darussalam	Syria
		Zimbabwe	El Salvador		Taiwan
		Vietnam	Jamaica		Trinidad & Tobago
		Malaysia	Haiti		Ukraine

Skulematters

Faculty of Applied Science and Engineering

The Faculty of Applied Science and Engineering at the University of Toronto dates back to 1873. Since its inception, it has earned an international reputation for excellence in teaching and is known as a forward-thinking and crucial resource regarding world concerns.

The history of Skule™ is but the biography of the great men and women who have walked through its halls. In this Faculty, students, professors, and alumni come together to share knowledge and benefit from a progressive environment where great ideas and innovations are born.



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