



MESSAGE FROM THE DEAN

A new magazine. A new energy degree.

It is my pleasure to share with you our revamped alumni magazine. As a result of your feedback, we have made substantial changes. Everything is new (*with the exception of a few of your favourites, including the Dean's Message and Faculty/Alumni/Student News Pages*). I would like to draw your attention in particular to the "**Class Notes**" section on page 14. We very much hope that you will send us your important updates and keep this section growing with each issue.

For the inaugural issue of our transformed magazine, we have focused on groundbreaking research in **energy**. Everything in life touches on this important topic and, not unintentionally, so does much of what we as Engineers do every day. In the pages that follow, we illustrate important examples of how our alumni are making a significant impact on the world through their leading energy research. From revolutionizing the oil industry by reducing energy consumption by 50 per cent, to finding a low-cost and environmentally friendly way to harvest sunlight and convert it into electricity, Skule™ alumni from around the globe are answering the world's most pressing energy and sustainability questions.

I would like to announce one of the many initiatives in which we are working to keep the Skule™ experience unique and leading-edge. Beginning in the Fall of 2008, we will be offering an Energy Systems Option in the Engineering Science curriculum. **This new energy program will be unique in Canada** and will offer a combination of traditional and non-traditional energy technologies along with a systems planning approach. It will emphasize tradeoffs and efficiencies in integrated systems, rather than standalone technologies, while also varying the perspective from policy to the environment. We are very excited about this new energy degree and look forward to fostering its growth and seeing it flourish.

On behalf of the Skulematters Editorial Board, we hope that you enjoy this magazine and we continue to welcome your feedback so that this publication is one that you are proud to share with your non-Skule™ friends.

Cristina Amon
Dean and Professor

ABOUT THE NEW SKULEMATTERS

New Sections:

- My Favourite Skule™ Memory (write in with yours) – p.15
- In Memoriam – p.25
- Class Notes – p.14
- Department, Division, Institute Updates – p.16-24

Now Arriving in Your Mailbox in November and May

WITH SPECIAL THANKS TO 2006-2007 SKULEMATTERS EDITORIAL BOARD

- **Barry Levine** (Ind 8T4), *Alumni Representative*
- **Cristina Amon**, *Dean*
- **Greg Evans** (Chem 8T2; MASc 8T4; PhD 8T8), *former Vice-Dean of Undergraduate Studies*
- **Brenda McCabe** (Civ 9T4), *Vice-Dean of Graduate Studies*
- **Andrew Stelmacovich**, *former Executive Director of Advancement*
- **Sonia De Buglio** (Chem 9T4; MASc 9T8), *Associate Director of Alumni Relations*
- **Kate Brand**, *Associate Director of Communications*
- **Ruth Weinstock**, *Manager of Communications*

Our Energy Future

by Dr. Jan Carr

With energy so fundamental to our way of life, there will be both the pressure to change and the premium to pay for it.

We owe much to the societies of ancient history from which we inherited the fundamentals of our civilization. But today's society is equally indebted to the industrial revolution of the late 18th century that introduced artificial energy to replace the muscle power of horses and men. Wind power had been exploited for centuries, but it could be developed only where and when the wind blew. Early water power had similar limitations. Mechanical energy from burning fuel provided motive power in virtually unlimited quantities, whenever and wherever it was needed. Mining, manufacturing and transportation soon replaced agriculture as the basis of the world's leading economies.

Later on, in the late 19th century, science and business opportunities converged to spawn the electric power industry. Energy could be produced wherever a fuel source was available and transported over considerable distances to power homes and businesses. Industrialized societies progressed through the wider distribution of wealth, which allowed advances in education, health and general well-being.

Later, electricity emerged as an "energy currency". Like conventional currency, electricity has no intrinsic use except as an intermediary between source and end-use. Energy from many sources – falling water, burning fossil fuels, fissioning atoms and blowing wind – could be transported virtually anywhere for an even wider range of uses – from powering industrial machines to processing and communicating information.

Canada's development has been heavily influenced by - and inextricably linked to - energy production and use. The "hydroelectric provinces" of Quebec, Manitoba and British Columbia have benefited from mining and smelting industries, which are heavy users of electricity. Canada's industrial heartland, Ontario, benefited enormously from the close proximity of Niagara Falls power developments to urban-area labour and markets. And the abundance of coal, oil and gas has spurred Western economies.

Canada is known worldwide for its hydroelectric developments and increasingly as the home of some of the world's largest hydrocarbon and uranium reserves.

Today, Canada's energy industry has an annual GDP of more than \$60 billion and employs almost 300,000 people. Electric power represents about one-third of this activity, as does oil and gas extraction, with the balance consisting of coal mining, pipelining and support activities. Energy plays a major role in Canada's export earnings, representing some 20 per cent of all merchandise exports.

Canada's history and status as an energy giant raise questions about our future in a world where hydrocarbon use will be constrained to mitigate climate change and our prosperity is based on depleting resources. Perversely, the objective of reducing carbon use exacerbates the concern about resource depletion, since we have smaller reserves of the lowest carbon fuels – gas and oil – than of the highest carbon fuel – coal.

To be sure, technology could increase end-use efficiency and decrease the need for energy production. Advances can also be made to reduce carbon use in the energy cycle, both by relying more heavily on renewable and nuclear energy and by capturing carbon released during energy production.

However, this won't happen without price increases, since we have already exploited all the lowest cost options. The highly technological energy industry has enormous elasticity to respond to changing circumstances. With energy so fundamental to our way of life, there will be both the pressure to change and the premium to pay for it.



Dr. Jan Carr (ECE 6T8), who has more than 30 years of experience in the electricity sector as a professional engineer, was appointed Chief Executive Officer of the Ontario Power Authority (OPA) in 2005. Prior to joining the OPA, Dr. Carr was Vice Chair of the Ontario Energy Board.

Dr. Carr has worked on projects in Asia, Africa, Central America and the Caribbean. He has been a consultant to utilities, governments and other stakeholders on the financial, business, strategic and policy aspects of the electric power industry and has held senior positions in the design and planning of electricity transmission and distribution systems. He was selected as the winner of the Professional Engineers Ontario 2007 Engineering Medal - Management Category.

Tell us your thoughts about Canada's energy future.

email: alumnews@ecf.utoronto.ca



(Photo: Chris Bolin)

“Too good to be true.”

That’s what skeptics have said when first hearing about the new oil sands upgrading technology developed by Dr. Columba Yeung (Chem 7T1; MASc 7T3; PhD 8T1), Chairman and CEO of the Value Creation Group (VCG).



TOO GOOD TO BE TRUE?

Yeung’s proprietary technology has been described as the most energy-efficient, environmentally friendly and cost-effective method developed to date to extract and refine bitumen from Alberta’s oil sands.

But even skeptics stop in their tracks when they learn more about Yeung’s impressive history of finding answers to “mission impossible” technological problems in his 24 years at Shell Canada and Royal Dutch, the details of his techno-economic innovation, and the dramatic savings his breakthrough methods promise. At \$45,000 per flowing barrel – an industry measure of capital intensity – VCG’s estimated costs are less than half of other developers.

With oil prices soaring, it’s no wonder VCG’s announcements have sparked recent headlines in major business publications; or that the start-up has been fielding calls from many of the world’s mega-oil companies. Enbridge Inc. signed on as its strategic partner in 2005 to pursue oil sands energy infrastructure development. And it’s no wonder that *Alberta Venture* magazine recently chose Yeung as one of its “50 most influential people of 2007”.

Adding to the young company’s strength in a field dominated by large, well-capitalized companies is the enormous Alberta land position VCG has assembled near Fort McMurray, said to be the largest wholly owned oil sands resource held by a private Canadian corporation.

VCG comprises three companies: Value Creation Inc., founded by Hong Kong-born Yeung in 1998; Technoeconomics Inc., the company’s technology development arm; and subsidiary BA Energy Inc., formed to design, construct and operate a new upgrader near Edmonton, using VCG’s technology. The firm anticipates that its Heartland Upgrader will ultimately produce 260,000 barrels per day of oil products tailored to North American refineries. Phase one is slated for 2009.

Yeung is one of four Skule™ alumni involved in VCG. Others include: Dr. Ian Chan (Chem 7T3), VCG’s Vice President, International Alliances and a Director on the BA Energy Board; Scott Joliffe (Chem 7T3), also a BA Board Director; and Kevin Melnyk (Chem 8T8), BA’s Vice President of Operations. Skule™ classmates may recall that Joliffe was EngSoc President and Chan was Treasurer.

As a student, Chan says Yeung was, “the number one guy in his class”. The two later became very close when Chan joined Yeung’s team at Shell in the early 1980s. Chan described Yeung as “legendary” for his contributions to Shell Canada’s Scotford refinery and its Athabasca Oil Sands Project, as well as Royal Dutch Shell’s multi-billion dollar Nanhai refinery and petrochemical complex in China.

“Columba is the type that gets consumed by a problem,” stated Chan, recalling that Yeung was so determined to solve a challenging technical quandary he faced at Shell, that he stayed awake for three nights straight.

That single-mindedness stood Yeung in good stead in 1998, when he started a five-year quest in Alberta labs, to find more viable ways of refining bitumen, by analyzing every aspect of the oil sands development value chain.

His new process involves two stages. First, instead of adding diluent to make the viscous bitumen flow through a pipeline, as is conventionally done, Yeung applied the principles of colloidal physics. Contaminants are selectively removed at low

pressure and temperature, including about 99 per cent of the asphaltenes which make the crude thick and tar-like. The result is a low contaminant crude, pumpable with no or little diluent. Another plus is that the rejected asphaltenes can also be used as an energy source, for example, to replace coal in cement production.

The second stage, “ultra-selective pyrolysis” (USP), employs a rotating drum reactor, unique in the oil industry (visualize cement drums). The drum rotation, high temperature and very low reaction time used, maximize the amount of liquid produced. A bonus byproduct of USP is a light gas that can be used to eliminate or reduce the need for natural gas, as well as producing petrochemical feedstock.

“What Columba is doing is amazing,” said Chan, admiringly, calling his friend’s new process “robust, ingenious and logical.” When Yeung first called Chan with his fledgling idea, his classmate didn’t hesitate to invest. Chan smiled, “I’ve seen his crazy notions become great ideas”.

FAST FACTS ABOUT VCG TECHNOLOGY

More than 50% reduction in:

- Gas emissions, compared to existing technologies
- Energy consumption, compared to conventional upgrading processes
- Operating costs, compared to industry benchmark

FAST FACTS ABOUT VCG

- Estimated 30 to 35 billion barrels of original-oil-in-place on leases owned by VCG, one of the largest oil sands blocks held in Canada by a private company
- The firm is building western Canada’s first merchant bitumen upgrader, with about 260,000 barrels per day capacity

Grad's Work Powered by the Sun

I feel privileged to work with talented people on cutting edge projects in solar thermo chemistry. The daily discoveries and progress are tangible," said Nicolas Piatkowski (MIE 0T5), reflecting on his PhD studies at ETH Zurich, (the Swiss Federal Institute of Technology).

Piatkowski's group is one of few in the world investigating how high temperature industrial or chemical processes traditionally powered by fossil-fuels or electricity – such as cement production and coal gasification – could instead be run with concentrated solar radiation as the source of heat.

In the concentrated solar radiation process, a cavity receiver is irradiated with a solar flux often exceeding 5,000 Suns, rapidly producing temperatures in excess of 2000K. At these temperatures, petcoke, charcoal and coal can be reacted with steam to produce synthesis gas, cement lime can be fired, and metal oxides can be reduced to pure metals and oxygen - entirely powered by the sun.

Piatkowski said he believes one of the group's most innovative current projects is the sustainable production of hydrogen from sunlight and water.

"This project has huge potential for significant impact in realizing a hydrogen economy," he said. "Our group is the closest to creating a functioning prototype."

In the two-step process, a metal oxide is reduced to pure metal and oxygen at 2100K. By hydrolyzing the pure metal, the initial metal oxide feedstock is recovered and can be reused, while hydrogen is produced without using electricity or fossil fuels.

Piatkowski's own work focuses on developing new technology that could enable much cleaner and more efficient use of the world's enormous coal reserves. He is investigating the use of solar energy in the steam-reforming of coal for synthesis gas (H₂ and CO) production. Synthesis gas can be applied to any combustion process. It offers a higher heating value and lower CO₂ intensity than the initial coal feedstock, as well as vastly lower emissions.

"My time at U of T was a fantastic period of personal and academic growth," Piatkowski said. "The depth and quality of the knowledge I gained have given me immense confidence in pursuing the demanding and multifaceted field of solar chemistry at ETHZ."

Piatkowski completed his master's at ETHZ last April. The renowned university was founded in 1855; Albert Einstein was both a student and professor there. Piatkowski's supervisor, Professor Aldo Steinfeld, heads both the Solar Technologies Laboratory at the Paul Scherrer Institute and also the Professorship for Renewable Energy Carriers (PRE) at ETHZ.

Nicolas Piatkowski (MIE 0T5), now researching solar thermo chemistry as a PhD candidate at ETH Zurich said, "The mechanical engineering education at the U of T easily holds its own with the world's best technical universities." (Photo: Michelle Gibson)



Yanyan Yuan, (MSE MASc 0T4, PhD 0T7) in Professor Zhenghong Lu's Organic and Polymer Optoelectronics Laboratory at U of T, where she worked on a process currently being developed by a U of T spin-off company, Norel. (Photo: Zhibin Wang)

GERMAN FELLOWSHIP SUPPORTS STAR SOLAR RESEARCHER

Materials Science and Engineering graduate Dr. Yanyan Yuan (MSE MASc 0T4; PhD 0T7) was recently awarded a prestigious one-year fellowship from the Alexander von Humboldt Foundation to further her research at the Universität zu Köln (Cologne).

The fellowship, established in 1953 by the German government, enables outstanding scholars from abroad to pursue their research in Germany. Yuan began her fellowship in October 2007.

As part of Materials Science and Engineering Professor Zheng Hong Lu's research group since 2002, Yuan's research has been on organic light-emitting diodes (OLEDs) which convert electricity into light. Her research, which has resulted in four patents, has been focused on developing fullerene-containing composite materials in order to improve the luminance efficiency, thermal stability and mechanical flexibility of OLEDs.

While in Germany, Yuan is researching organic solar cells, a low-cost and environmentally friendly way to harvest sunlight and convert it into electricity. Currently there is increasing interest in combining polymers and small molecules into a hybrid solar cell, in order to capitalize on their combined advantageous properties.

Among groups researching organic electronics, Professor Klaus Meerholz, whose team Yuan has joined in Köln, is reputed to be one of the global leaders focusing on polymer materials. Her U of T studies on organic small molecules complement the expertise in Meerholz's lab, opening the potential to develop hybrid organic solar cells with improved spectral coverage and power conversion efficiency.

Yuan said, "Once organic solar cell technology is commercialized, it will alleviate the energy crisis, as well as the environmental stresses caused by pollution."

Do you know Skule™
alumni involved in
solar energy? Tell us.

alumnews@ecf.utoronto.ca

From the Arctic to Zambia, Sudbury to Sweden, Tim Christie's (MIE OT1 + PEY) passion for making the world just a bit better has taken him to some of the earth's hottest and coldest climates and into its depths.

After graduating from U of T, Christie ran Environment Canada's High Arctic Air Chemistry Observatory in Alert, Nunavut, for a year.

"I wanted to further our understanding of climate change," Christie said. "As the world's most northerly settlement, Alert is far away from pollution sources and an ideal location to study the northern hemisphere's background pollution levels."

Next, Christie headed to Zambia to work with Médecins Sans Frontières (MSF) as a logistician. He set up and ran cholera treatment centres and a water treatment and distribution system there. He also designed and built a new rural HIV treatment clinic.

After Africa, Christie spent a year working at the Neutrino Observatory in Sudbury, Ontario, one of the world's foremost low background radiation research labs.

In August 2006, Christie went to Stockholm to pursue a master's in sustainable energy engineering - a topic he had already shown commitment to by powering his car with recycled chip-truck grease (when not riding his bicycle). A year later, Christie completed his coursework at the Swedish Royal Institute of Technology. He's now working for GreenSaver in Toronto while completing his thesis. GreenSaver performs energy audits and retrofit services. He has initiated the non-profit's pilot program to make energy efficiency retrofits more cost-effective.

"Many homeowners spend on aesthetic improvements, rather than better insulation, because its value is not recognized when the house is sold. A certification system would help correct this market failure," Christie explained. He also manages the Greening Sacred Spaces program, to make local churches and temples more energy-efficient.

Though his engineering career may seem eclectic, Christie is driven by single sense of purpose.

"Engineers can be credited with many of society's great advancements, but those advances came with an environmental price. I'd like to understand the problems we've contributed to, and work to provide sustainable solutions to them."



With a crew of construction workers from Kapiri M'poshi, Zambia, Tim Christie (MIE OT2; in back row, third from right) built a new HIV treatment clinic. [Photo: Tim Christie - taken with at tripod]



Tim Christie (MIE OT2) is shown in Alert, Nunavut, where he ran Environment Canada's High Arctic Air Chemistry Observatory for a year, as part of the effort to further our understanding of climate change. The photo was taken at noon in late summer. [Photo: Tim Christie - taken with at tripod]



Dr. Rosamund Hyde (Civ PhD 9T9) outside Stantec Consulting Ltd. in Vancouver. Her career has been devoted to helping building designers reduce energy consumption and emissions.

Living Fully with Lower Energy Consumption

If, while exploring the internet, you find a Building Performance Evaluation Protocol, (www.ecosmart.ca) intended to help building designers substantially reduce energy and emissions, while maintaining occupants' comfort, one of the people to thank is Dr. Rosamund Hyde (Civ PhD 9T9).

Hyde raised money to develop and pilot the Protocol, one of many ways she has devoted her personal and professional life to issues of sustainability.

"Buildings are responsible for at least 30 per cent of Canada's greenhouse gas emissions," Hyde noted.

As a U of T student, she became interested in the environmental impact of buildings and volunteered on the Board of the Taskforce on the Churches and Corporate Responsibility. The multi-tasker also completed her doctorate on educating environmentally responsible engineers the week she had her second baby!

Buildings are responsible for at least 30 per cent of Canada's greenhouse gas emissions

After graduation, Hyde worked for Vancouver-based Keen Engineering, passing, and encouraging colleagues to pass, the LEED® exam. Through their efforts, Keen had for a time more LEED Accredited Professionals than any other firm in the world. Hyde now works as a research engineer for Stantec Consulting Ltd., which acquired Keen in 2005. With more than 100 North American locations, Stantec's 6,500 employees deliver a wide range of sustainable solutions.

Hyde still does environment-focused volunteer work with the churches and other groups. She helped to set up the local chapter of the Canada Green Building Council and continues to volunteer for the Council.

Hyde stated, "Our family has been car-free since 1999, using only public transit or bicycle, with the occasional taxi. I believe we can live fully, as we experiment with radically lower levels of energy consumption."

Do you know an alum making a difference through volunteer or professional work? Tell us... alumnews@ecf.utoronto.ca

A degree from Canada's largest and one of the best engineering schools in North America puts you in excellent company. U of T engineers are among the most innovative, dynamic and distinguished leaders in the world. We are proud of every one of our 40,000 alumni. But every once in a while, a graduate stands out from the crowd, demonstrating superior accomplishments, a unique capacity for leadership, and extraordinary personal commitment and service to your alma mater.



paul CADARIO

Paul Cadario, Civ 7T3
Hall of Distinction

With a record of accomplishment spanning North America, Europe, Africa and Asia, Paul Cadario is living proof of how U of T Engineering prepares graduates for complex leadership roles. The Senior Manager of Trust Fund Quality Assurance & Compliance at The World Bank is widely recognized as a 'knowledge management' leader, helping to guide the Bank through complex organizational change and a near tripling of its trust fund portfolio to more than US\$21B. While assuming progressively more senior roles with the Bank, Paul remained an active member of the Engineering Dean's Advisory Board where he played a key role in curriculum reform, and currently serves as President of the University of Toronto Alumni Association.



michael SEFTON

Michael Sefton, Chem 7T1
Hall of Distinction

Long before 'tissue engineering' became recognized, Michael Sefton was developing procedures to enable nerve regeneration, artificial skin and cornea replacement. A U of T alumnus, University Professor and the Michael E. Charles Chair in Chemical Engineering, Michael is a research pioneer. He was the first to recognize the importance of combining living cells with synthetic polymers to create biological tissue and artificial organs – the field now known as tissue engineering. Through the development and biological application of new biomaterials, Michael has authored more than 10 patents, some of which are now being commercialized for therapeutic purposes.



tom CLOSSON

Tom Closson, Ind 7T1
Hall of Distinction

Tom Closson's name is synonymous with accountability and a renewed sense of mission for exemplary patient care, research and education in Canadian hospitals. Over the past decade, he has been President and CEO of three major Canadian health care corporations. Most recently, at University Health Network (UHN), he worked to reduce emergency wait times, improve lab efficiency and lower the rate of re-admission. Between 1999 and 2004, Tom doubled UHN's research funding to \$156M and played an important role in the construction of U of T's MaRS campus. Since stepping down as head of UHN in 2005, he has become a sought-after advisor to health care institutions across Canada.



phillip SIMMONS

Phillip (Rocky) Simmons, Chem 6T4; MASc 6T5; PhD 6T8
Hall of Distinction

Rocky Simmons was a U of T doctoral candidate when he first demonstrated the feasibility of an ion-exchange technology, which, 20 years later, would become the focus of a highly successful Canadian company. Together with his partners, Rocky founded Eco-Tec Limited in 1985. Now ISO certified, the company is an international leader in the development of water treatment and chemical recovery systems used by power generation, pharmaceutical, automotive, chemical, pulp and paper, and metal processing industries worldwide. Rocky credits his success to a strong management team, comprised largely of U of T Engineering graduates. He retired as President and CEO of Eco-Tec's operating company in 2006.



chris ROSCOE

Chris Roscoe, EngSci 0T7
L.E. (Ted) Jones Award of Distinction

New graduate Chris Roscoe brought music to Skule™. In between classes over the past five years, he founded two new groups – the Brass Ring and the Skule™ Jazz Combo; led the largest stage band in recent history – the Skule™ Stage Band – to a winning finish at the 2007 Kiwanis Music Festival; hosted the first ever Skule™ Music Concert; and performed in all five of the Faculty's music ensembles. A talented classical French horn and jazz trumpet player, Chris was also a frequent solo and duet performer at Faculty and University events.



david LEE

David Lee, EngSci 0T7
L.E. (Ted) Jones Award of Distinction

Piano, clarinet, alto saxophone, oboe, viola, contrabass – few instruments escaped David Lee's touch during his four years at U of T Engineering. The talented musician was also a skilled leader and mentor. In his third year of study, he was named Director and Conductor of the Skule™ Stage Band and Musical Director of Skule™ Nite 0T6. Working on behalf of the Skule™ Nite Orchestra, David recruited 16 musicians – more than ever before – and wrote all the arrangements for the 2005-2006 year. In 2006-2007, he co-founded the Skule™ Orchestra while maintaining a solid cumulative GPA of 3.71.



anthony LACAVERA

Anthony Lacavera, ECE 9T7
7T6 Early Career Award

Anthony Lacavera has accomplished more in his 32 years than most people do in a lifetime. After co-founding Globalive Communications Corp. in 1998, he led the next generation telecom company through the launch of 18 products in 30 countries. In 2004, Globalive earned the top spot in Profit Magazine's list of Canada's fastest growing companies, it was named one of Canada's 50 Best Managed Companies for three years running, and Globalive is one of *Canadian Business Magazine's* Top 30 Workplaces in Canada. As Chairman and CEO, Anthony is lauded for his outstanding leadership and vision. In 2006, he was recognized as one of Canada's Top 40 Under 40.



john YEOW

John T.W. Yeow, ECE 9T7; MASc 9T9; PhD 0T3
7T6 Early Career Award

John Yeow has an ambitious vision of a hand-held x-ray machine that targets cancerous tumours while sparing nearby, healthy tissue. The systems design engineer at the University of Waterloo (UW) is a rising star in the highly competitive field of nanotechnology whose work has the potential to change the delivery of health care. As Director of the Advanced Micro/Nanodevices Laboratory, John is also deeply committed to training the next generation of engineers. He currently supervises 13 graduate students and was honoured in 2004 and 2005 with UW's top awards for exceptional contributions in the areas of teaching, research and service.



john VOSS

John Voss, Chem 8T2
2T5 Mid-Career Award

In the seven years since John Voss established Aegent Energy Advisors Inc., the company has grown to support more than 50 clients representing \$700M of annual energy procurement. As President and Managing Director, John helps large energy buyers reduce costs and manage risk. He is one of the bright minds behind RiskSensor®, Aegent's proprietary technique for quantifying risk. He is Past President of U of T's Engineering Alumni Association, a member of the Faculty's Steering Committee on Engineering and Public Policy, and John previously served on the Department of Chemical Engineering and Applied Chemistry's Board of Advisors.



barry LEVINE

Barry Levine, Ind 8T4
Malcolm McGrath Award

Barry Levine has exemplified outstanding personal service and commitment to his alma mater since graduating 23 years ago. Over two decades, he has served in virtually every executive position on the Engineering Alumni Association; as President in 1998-1999, he initiated a review that ultimately led to the association's restructuring and new constitution adopted in 2006. He is the long-time Chair of the Communications Committee of the Engineering Alumni Association and the author of a history of the Engineering Society, published to honour the Society's centennial in 1985. In 1989 and again in 1998, he was recognized with the Faculty's distinguished awards for volunteerism.



pierre RIVARD

Pierre Rivard, Mech MEng 9T4
Engineering Alumni Medal

Pierre Rivard had one purpose in mind when he embarked upon a Master's of Engineering degree at U of T in the early 1990s – to better understand hydrogen and fuel cell technologies. By 1995, he had co-founded Hydrogenics Corporation, recognized today as a leading global developer of clean energy solutions and one of North America's fastest growing technology companies. As President and CEO (1995-2006), Pierre led the \$120M acquisition of Stuart Energy Systems, built strategic alliances with General Motors and attracted top-tier international customers, including Chevron, John Deere and Toyota. He was named Executive Chair of the Board in 2006.

SAVE THE DATE:

**Hall of Distinction Unveiling
Saturday, May 31, 2008**

**2nd Floor,
Sandford Fleming Building,
University of Toronto**

**For more information, please contact
the Engineering Alumni Office: phone:
416-978-4941, fax: 416-946-3450,
email: info@skulealumni.ca**

ALUMNUS BILL TURNER ENABLES STUDENTS TO ATTEND WORLD ECONOMIC FORUM

A chance to attend the World Economic Forum (WEF) in Davos, Switzerland, and learn from international corporate and government leaders as they grapple with finding co-operative solutions to world problems. What student wouldn't relish that kind of life-changing experience? Thanks to alumnus Bill Turner, who graduated from the Engineering Business program in 5T1 and is Chairman and CEO of Exsultate Inc. some lucky engineering students have been - and will be - able to do just that.

A grant established by the William and Nancy Turner Foundation opens this opportunity to selected full-time Skule™ undergraduates who have completed and excelled in their third year studies. Special arrangements are made for the students chosen - usually two each year - to work at the WEF, so they can witness the interaction first-hand.

To date, three students have been selected to attend the high profile forum. Nick Wood (Chem 0T6) received the inaugural Turner grant in 2006. Nicole Di Carlo (EngSci 0T7) and Emily Ross (Ind 0T7) were awarded the travel grant in 2007. And Sara Dolcetti, now in her Professional Experience Year after completing third year Industrial Engineering, will travel to Davos in January, 2008.

"The Faculty is extremely grateful to the Turner Foundation for providing this unique opportunity to encourage and enlighten students who have shown leadership potential," said Professor Cristina Amon, Dean of the Faculty of Applied Science and Engineering. "At the WEF, students can enhance their perspectives and learn how leaders today collaborate to address complex problems."

The Turner family has a long history of involvement in supporting the Faculty, starting with Bill's father, William I.M. Turner (Elec 2T5), who served as President of the Engineering Alumni Association. Bill's brother, Peter (EngBus 5T4), was a founding member of the Dean's Advisory Board. The brothers previously established two other scholarships to benefit Engineering students and honour their late parents.

ECE Student Receives Top Honour for Top Marks



Prof. Jonathan Rose, Chair of The Edward S. Rogers Sr. Department of Electrical and Computer Engineering (L) and Clifford Ting (R).

Clifford Ting (ECE 0T7) received the 2007 Governor General's Silver Medal at convocation this June in recognition of his dedication to academics. This prestigious honour is awarded annually to only three U of T undergraduates who have achieved the highest academic ranking. His cumulative grade point average was 96.3 per cent. Ting is the tenth student from the Faculty of Applied Science and Engineering to receive this award in the past 11 years.

Ting also received three medals from the Faculty at the end of his fourth year - the W.S. Wilson Medal for being the top graduating student in his program; the Henry G. Acres Medal for having the highest aggregate percentage in years three and four; the Adel S. Sedra Medal for the highest cumulative GPA in Electrical Engineering; and the Enwave Scholarship in Electrical Engineering for aptitude in studies related to power generation and distribution.

A new graduate, Ting works for Altera Toronto Technology Centre as a Software Engineer with the power modeling team.

Graduate Student Invention Featured in Canadian Business

James Fung (ECE PhD 0T7) a recent graduate of The Edward S. Rogers Sr. Department of Electrical and Computer Engineering was featured in the February 12 *Canadian Business* issue on noteworthy business innovations. The innovative invention, Glogger, is a wireless technology that enables photos to be taken on camera phones and posted immediately to the Glogger website. Glogger was developed by ECE Professor Steve Mann, Fung when he was a PhD candidate, and another student in computer science at U of T.

Glogger works anywhere with cellphone reception and has a number of possible uses commercially, according to its inventors. The technology can also be used on a daily basis. For instance you can show a friend the step-by-step process for making a dinner recipe. "You just snap pictures as you go and by the time you're finished, all the pictures are on the web," said Fung.

www.glogger.mobi

Canada's Most Outstanding Engineering PhD Student in 2008-2008 Competition

PhD Candidate Albert H. Vette in the Institute of Biomaterials and Biomedical Engineering was recently selected by the Natural Sciences and Engineering Research Council of Canada (NSERC) as Canada's most outstanding Engineering PhD student in a 2007-2008 scholarship competition. Supervised by Professor Milos R. Popovic, in 2006 Vette also received a Summer Program Fellowship from the Japan Society for Promotion of Science (JSPS). This award provides young researchers the opportunity to conduct research at Japanese universities and designated research institutions and labs.



Awards and Accolades

In the past year the Skule™ community has received more than 150 prestigious international awards. Excellence in teaching, research, and scholarship is a vital part of our mission, and the fact that our community is so highly recognized for achievements in these areas is a true testament to our success. While we cannot report on all 150 awards, we would like to pay special tribute to our teaching excellence on this page.

Here's a snapshot of some of the teaching awards we've received in the past year:

Ministry of Training, Colleges and Universities Leadership in Faculty Teaching (LIFT) Award

Yu-Ling Cheng, Chemical Engineering and Applied Chemistry

Eng Soc Teaching Award for Instructors

Murray Grabinsky, Civil Engineering

Faculty of Applied Science and Engineering's Faculty Teaching Award

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

Faculty of Applied Science and Engineering's Early Career Teaching Award

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

University of Toronto SAC/APUS Undergraduate Teaching Award

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

Top 10 Finalist in TVOntario's Best Lecturer Competition

Bryan Karney, Division of Environmental Engineering and Energy Systems

3M National Teaching Fellowship

Susan McCahan, Mechanical and Industrial Engineering

University of Toronto President's Teaching Award

Susan McCahan, Mechanical and Industrial Engineering

Eng Soc Teaching Award for Instructors

Glenn Hibbard, Materials Science and Engineering

Alan Blizzard Award

Susan McCahan, Mechanical and Industrial Engineering

Robert Andrews

Mark Kortschot, Chemical Engineering and Applied Chemistry

Kimberly Woodhouse

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

Peter Weiss

Sandy Romas, Former Administrative Assistant for the Faculty

Professor Susan McCahan Receives Canada's Top Teaching Award



Chair of First Year and Mechanical and Industrial Engineering Professor Susan McCahan was the sole University of Toronto recipient of Canada's highest award for excellence in teaching - the 3M National Teaching Fellowship.

"Professor McCahan's breadth of contributions and accomplishments, the impact of her innovative teaching and her leadership in education pedagogy for future engineers speak to the very qualities that this award recognizes," said Professor Cristina Amon, Dean of the Faculty of Applied Science and Engineering.

McCahan began her teaching career at U of T in January 1993. After teaching her first course, she received the highest teaching ability rating from the student course evaluations for any Mechanical Engineering course.

The 3M National Teaching Fellowship is sponsored by the 3M Canada Company and the Society for Teaching and Learning in Higher Education.

Engineering Team Receives Blizzard Award for Collaborative Teaching

A seven-person teaching team in the Faculty of Applied Science and Engineering at the University of Toronto received the 2007 Alan Blizzard Award for collaboration in teaching. This is the first time a team from U of T has won this prestigious award.



The team includes:

- Susan McCahan, Associate Professor in Mechanical and Industrial Engineering and currently Chair of First Year for the Faculty of Applied Science and Engineering
- Philip Anderson, Senior Lecturer in The Edward S. Rogers Sr. Department of Electrical and Computer Engineering
- Robert Andrews, Professor in Civil Engineering
- Mark Kortschot, Professor in Chemical Engineering and Applied Chemistry
- Sandy Romas, former Administrative Assistant for the Faculty
- Peter Weiss, Senior Lecturer in the Engineering Communication Program
- Kimberly Woodhouse, former Professor in Chemical Engineering and Applied Chemistry and current Dean of Applied Science at Queen's University

They received the coveted Blizzard Award for leading the full implementation of a mandatory first-year engineering class titled Engineering Strategies and Practice (ESP). The course was conceived in early 2003 by Professors McCahan, David Bagley, David Kuhn and Subbarayan Pasupathy, and led by Professor Will Cluett, currently Chair of the Division of Engineering Science. Overall, more than 50 faculty and staff in Engineering have contributed to the creation of this course. This national Award is sponsored by the STLHE and McGraw-Hill Ryerson.

For more information about ESP: www.ecf.utoronto.ca/~apsesp

CATCH UP WITH YOUR CLASSMATES

Please keep us updated on developments in your life – career news, marriages, births, and more. Please visit our website to submit your Class Note for our next issue of Skulematters: www.skulematters.engineering.utoronto.ca.

4T3 John Dyke (Mech 4T3), whose 35-year career in steam generator design included leading the Pickering A nuclear station design team, has written memoirs on Candu history. Go to: <http://can-teach.candu.org>.

5T3 Ike Goodfellow (ECE 5T3; MASc 5T4) is the rep for the Class of 5T3 and wants to remind fellow classmates that our 55th reunion is coming up! Contact Ike for more info: ike.g@sympatico.ca

6T8 CK Chang (Mech MEng 6T8) had a long career with Shell and was involved in a myriad of roles in a number of different countries. In late 2005, he, along with a few peers, founded a company called 'Asian Pacific Petroleum Associates' based in Singapore.

7T0 David Strathern (Chem 7T0) was appointed to the Niagara Parks Commission in June 2007, following a career in the pulp and paper industry.

7T7 Christopher Solecki (Civ 7T7; MASc 7T9) works at Hatch Mott MacDonald as the firm's Airport/Aviation Practice Manager and a Senior Vice President. His son, Andre Solecki (Civ 0T7) also works at Hatch Mott MacDonald.

7T8 Lorna Gibson (Civ 7T8) was appointed Associate Provost at the Massachusetts Institute of Technology (MIT) in August 2006. She is also the Matoula S. Salapatas Professor of Materials Science and Engineering, Professor of Mechanical Engineering and

Professor of Civil and Environmental Engineering. Prof. Gibson was recently appointed to the University of Toronto Faculty of Applied Science and Engineering Dean's Advisory Board.

8T3 Clarissa Brocklehurst (Civ 8T3; MASc 8T5) was appointed Chief of Water and Environmental Sanitation at UNICEF in April. The appointment caps a distinguished 12-year career as a water supply and sanitation consultant that started with her master's thesis on the water and sanitation needs of 13 aboriginal reserves in Manitoba. Her work has taken her to Bangladesh, Cameroon, India, Kenya, Mozambique, Nepal, Nicaragua, Pakistan, Senegal, Sri Lanka, Tanzania, Tibet, Togo and Zambia. www3.sympatico.ca/cbrocklehurst

8T6 John Rowsell (Civ MEng 8T6) recently started his third term as Mayor of the City of Sault Ste. Marie, Ontario and works at his engineering firm where he specialized in structures, welding, and metallurgy.

8T9 Peter Noble (Chem 8T9) moved to Calgary with Imperial Oil two years ago, along with his wife, Joy. Peter is the chair of the new Skule™ Alumni chapter in Calgary. calgary@skulealumni.ca.

9T1 Christina Heidorn (EngSci 9T1) is currently a producer with CBC TV's Documentary Unit, working on the "Confidential" series. She has also been a producer and writer on projects for National Geographic, Discovery, TLC, and several European broadcasters. On

National Geographic, you may have seen her film on the aurora borealis, "Riddle of the Polar Sky," or on CBC's "Fifth Estate" documentary on the science behind surviving a lightning strike.

9T2 Deb Chachra (EngSci Physics 9T2; MASc 9T5; PhD 0T1) co-founded Science Outreach at Skule™ and is currently Assistant Professor of Materials Science at Franklin W. Olin College of Engineering in Massachusetts.

9T5 Bobby John (ECE 9T5) currently lives in Atlanta, Georgia, where he co-founded CreationStep (www.creationstep.com) and Indoor Playground (indoorplayground.ning.com).

9T7 Luis Zubieta (ECE MASc 9T7; PhD 0T1) is the Senior Project Engineer for Burlington-based SatCon Power Systems (SPS), a division of SatCon Technology Corporation, which focuses on power electronics for alternative energy sources. As well as its main product, 30 kW to 500 kW inverters for photovoltaic applications, the firm also builds power converters for fuel cell stationary power generators, designing and delivering converters of up to 2.4 MW.

0T3 David Deak (EngSci 0T3) just completed his DPhil (equivalent to a PhD) at Oxford, where he began studies in Materials Science in 2003. He founded the Oxford branch of Engineers Without Borders and in 2006 he was inspired to train for the Ironman Triathlon. Since then, he has competed in this grueling contest in the U.K., Monaco, and Austria and finished in the top 50 per cent of the inaugural Ironman 70.3 World Championships, held in Clearwater, Florida.

0T5 Seyed Alireza Rabi (EngSci 0T5) is a second year MD-PhD candidate at Johns Hopkins University School of Medicine. In 2004, in the fourth year Biomedical Option, Rabi proposed writing new code to modify facial-recognition software created by his U of T ECE Professor, Parham Aarabi. The result is patent-pending software, called Modiface, that allows anyone to use a digital camera and Internet access to see what he or she would look like with specific altered facial features after having cosmetic surgery. Modiface Inc. partners are currently working with plastic surgeons to improve the system that might someday revolutionize plastic surgery.

0T7 Craig Milestone (PhD 0T7) and **Lisa Wise** (PhD 0T7) raced to wedding victory on September 4, 2007. The two competed in a wedding-themed obstacle course against two other couples to win a \$20,000 wedding package.

A very special thanks to those of you who were kind enough to send us information for the inaugural section of Class Notes.

MEMORIES SKULE™ MEMORIES

A 2T7 Grad Reminisces

Now in his 103rd year, Dr. Charles Sankey (Chem 2T7) joked, "I ain't what I used to was". Dr. Sankey, who entered Skule™ at age 15, recalled one of his professors, Harold Hibbard, as a "good tyrant". Hibbard insisted that students study from 8 a.m. to 10 p.m. and file a weekly report that he "pulled to pieces". "But, I couldn't have learned from anyone better," Sankey said. Sankey also remembered Professor Angus stating, in his first lecture, "If you read any Chem textbook, it will tell you that hydrocarbons are inactive. It is not only a lie, it is a G-d damned lie."

"I ate all my meals in Hart House," Sankey said. "It was an amazing place. For 37 cents you got a hot meal including fish or chicken, vegetables and coffee or tea." Sankey ultimately became the Vice President of a company that provided paper to the New York Daily News and the Chicago Tribune. He was mentioned at Spring Reunion 2007, when graduates of the "7's" were among the honoured years.

The Value of an Engineering Education

"My parents really valued education," said Henry Bernick (Mech 4T7). His family felt lucky to immigrate to a farm in Ontario in 1939, only four weeks before WWII was declared. Bernick recalled milking the cows at 4 a.m. by lantern light, before cleaning up and going to school. He sold the week's production of cream for \$3.65. His high school principal in Barrie arranged a bursary for Henry, who excelled at math and science, to enable him to attend Skule™. As one of few new Canadians in his class, Henry "kept his nose to the grindstone," studying hard to make sure he did well. He also volunteered for military training on campus. Bernick was on the train to Petawawa for further army training, when the war's end was announced.

Starting in 1954, Bernick led several land development companies. "Engineering gives you a tremendous background in clear thinking and planning," he said. "Nobody can take ability away from you; it resides in your head."

Hot Pink Lab Coats

Mike Hilson's (Chem 6T8) favourite Skule™ memory took place in his Organic Chem lab. Egged on by fellow student Zoltan Zongor (Chem 6T8), students used their new-found knowledge of dyeing processes to dye their lab coats fluorescent pink. Hilson, now the owner of Atlantis Photography, also recalls that his Skule™ fees totaled \$713 a year. Another indelible memory: the stampede to go play bridge when someone appeared at the door and yelled "fourth!"

Blowing Up the Dean's Car

Science Outreach, the Faculty's summer camp for students in grades 1 to 8, was founded in 1990 by Debbie Chachra (EngSci Physics 9T2; MASc 9T5; PhD 0T1) and Brian Sutherland, both EngSci students at the time. Here's their favourite memory, as told by Brian.

"Dean Gary Heinke, a committed supporter of Science Outreach, heard about our problems lugging our equipment to Toronto elementary schools to do workshops. He suggested in his very formal way that we should use his car, since he wouldn't need it during the day. We accepted, though we were a bit in awe of the Dean.

"Driving his Ford Taurus wagon in Toronto traffic was nerve-wracking. But our apprehension was amplified tenfold when, one day, the Dean offered his wife's car – an old gray Mercury Capri, instead of the Ford. Sure enough, as we started driving, the car suddenly blew up. Billows of smoke issued from under the hood. Debbie and I guessed that not only would Dean Heinke be upset since he'd be in trouble with his wife, he would be severely disappointed with Engineering students who couldn't fix the car before returning it. Fortunately, a \$16 radiator hose was all it took. As he received the carefully presented bill, Dean Heinke casually added that it was also frequently necessary to thump the starter motor with a wrench to get the car going. We grinned – it was a defining moment."



Lorna Gibson



Clarissa Brocklehurst



Christina Heidorn



Fernando Morgan



Seyed Alireza Rabi



Deb Chachra



David Deak



Craig Milestone

Lisa Wise



Kim Woodhouse with current graduate student Lauren Flynn (Eng Sci OT2) and former student Allison Brown (Chem 9T9 and PhD OT5).

Woodhouse named Queen's engineering dean

Chemical Engineering Professor Kimberly A. Woodhouse became Dean of the Faculty of Applied Science at Queen's University in Kingston, Ontario, on July 1. Though sad to leave the Department where she has been an active teacher and researcher since 1994, Woodhouse is excited by the new challenges ahead.

Prior to her departure, Woodhouse was awarded the Canadian Engineering Awards' Medal for Distinction in Engineering Education. She is also part of the team of instructors for the first-year Engineering Strategies and Practice course that was awarded the 2007 Alan Blizzard Award for collaboration in teaching. This is the first time a team from U of T has won the award, which is sponsored by the Society for Teaching and Learning in Higher Education (STLHE) and McGraw-Hill Ryerson.

Woodhouse is the first woman to lead the Faculty of Applied Science at Queen's and only the third female dean of engineering in Canada. U of T's Dean Cristina Amon, who is the nation's second female engineering dean, congratulated Woodhouse on her appointment. "This is a true measure of the high esteem in which Professor Woodhouse is held by all who know her," said Amon.

Despite her duties in Kingston, Woodhouse will continue to supervise and mentor students in Chemical Engineering as an adjunct professor.

Chem team raises over \$5,000 for Heart and Stroke

A team of graduate students, faculty and staff from Chemical Engineering rode a 30-person bike through the streets of downtown Toronto to raise funds for the Heart and Stroke Foundation on July 18. The team was organized by graduate student Tamas Fixler (Chem OT5), who also volunteers with the national charitable organization.

The bike, which is almost three metres wide and 10 metres long and weighs about 900 kilograms, was escorted by two police cars as it toured Toronto's financial district. Equipped with a sound system and full of energetic riders, employees in the surrounding skyscrapers got a taste of engineering's Skule™ spirit.

"It was fun and something I would definitely want to do again," said Arlene Fillatre, the



The Chem Eng Team aboard its 30-seat bike.

Department's business officer. As the top fundraiser, Fillatre was perched in the padded "easy seat." Even those with less desirable seats are ready to participate again next year and will be challenging other U of T Departments in the spirit of friendly competition.

The team far exceeded the local fundraising average with over \$5,000 in pledges.



Ed Drakich (Chem 8T5) is U of T's new head coach of men's volleyball team.

CHEM GRAD TO COACH BLUES

Ed Drakich (Chem 8T5) has been named the new head coach of the U of T Varsity Blues men's volleyball team. Drakich was a member of the Varsity Blues volleyball program from 1981-1985. A four-time OUA all-star and a three-time CIS first team all-Canadian, he helped the Blues earn OUA titles in 1983 and 1985 and a CIS bronze medal, also in 1985. He went on to play on national teams, including representing Canada in beach volleyball at the 1996 Olympics, and coached at the club, college and university levels. In addition to coaching the Blues, Drakich will also serve as an athletic instructor. "Ed Drakich possesses all of the fine qualities we look for in a leader and in a teacher, and we are thrilled to see him return to his alma mater to lead the Blues during this important time of renewal," said Dean Bruce Kidd of the Faculty of Physical Education and Health.

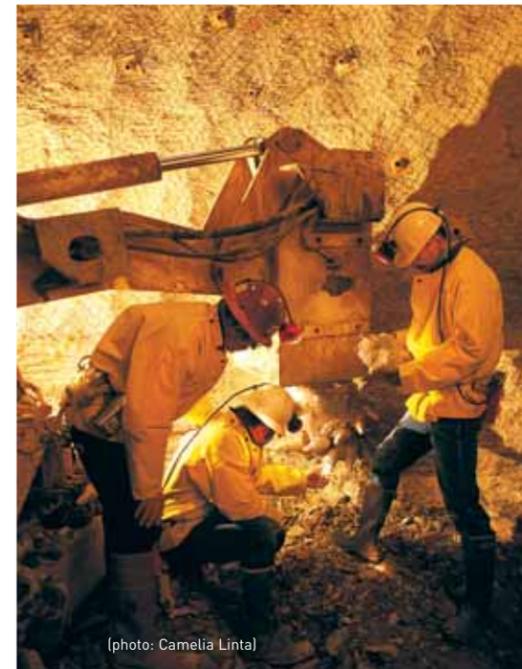
CHEM ALUMNI RETURN FOR REUNION

Celebrating their 50th and 25th anniversaries respectively, 30 members of the Chemical Engineering Classes of 1957 and 1982 were on hand June 2 for a lunch in their honour. Hosted in the Chem Undergraduate Common Room, graduates and their guests were treated to a trip down memory lane. Led by class leaders Ted Cross (Chem 5T7) and John Voss (Chem 8T2), a toast was offered to Skule™ before current students led alumni on a tour of the Wallberg Building.

REMEMBERING BASMADJIAN AND MISSEN

Chemical Engineering was sorry to lose two distinguished and long-serving faculty members. On February 28, Professor Emeritus Diran Basmadjian passed away. Professor Emeritus Ronald W. Missen passed away on March 31. Both had spent more than 30 years as valued members of the Department. Awards have been established in memory of both. To donate, please contact Liam Mitchell (Tel: 416-978-8770 or email liam.mitchell@chem-eng.utoronto.ca).

Dr. Pierre Lassonde Teaches New Entrepreneurship and Mining Course



(photo: Camelia Linta)

Fall 2007 marks the pilot of a new and innovative course in Civil Engineering and the Lassonde Institute. Dr. Pierre Lassonde, entrepreneur, former President of Newmont Mining Corporation and Chairman of the World Gold Council, will be teaching a course on Entrepreneurship and Mining. The course will initially have limited enrolment and will integrate theory and practice through case studies and mock industry investments. The mining industry landscape has evolved; today the industry is about the intersection of mining and engineering, high finance and solid business understanding and practices. Students will learn what it is like to work in the industry and some key business elements needed to succeed. The question is, with such a distinguished teacher...where do we sign up for the course?

Career Fair Welcomes Alumni

Civil and Mineral Engineering Alumni have been welcomed back over the past 10 years as company representatives at our annual Career Fair. Join us for this year's fair on Thursday, January 10, 2008, 9:30 a.m. to 3:30 p.m. Last year 34 companies and four industry associations participated. It's a great opportunity for prospective employers to meet our students. Contact Nelly Pietropaolo, nelly@civ.utoronto.ca or 416-978-0235.



(photo: Camelia Linta)

Thanking Friends of Survey Camp

On behalf of the undergraduate students and the Department we want to thank our alumni for their kind contributions to the Friends of Survey Camp fund, in support of the Camp's revitalization. Thanks to your generous response this year, we have replaced all the drafting tables and chairs in the two classrooms.

Many thanks to all who contributed their kind support. You have made a wonderful difference to the student experience.

Professor Paul Young Appointed U of T's Vice-President, Research

The University of Toronto recently appointed Professor R. Paul Young as its Vice-President, Research, beginning November 1, 2007.

Professor Young has been Chair of the Department of Civil Engineering, and Director of the Lassonde Institute for Engineering Geoscience. Before joining U of T in 2002, Professor Young held posts at the University of Liverpool, U.K., where he was Chair of Earth Sciences, Keele University, U.K., where he was Head of Earth Sciences, and Queen's University, Canada, where he established a Geomechanics and Rock Physics laboratory. He also served as the President of the British Geophysical Association from 1999 to 2003 and was special advisor to the 2001 United Kingdom Higher Education Funding Council Earth and Environmental Sciences Research Assessment Panel.



(photo: Camelia Linta)

In addition to being an outstanding scientist and teacher for over 25 years, a pioneer in rock mechanics and geophysics, applying his research to mining, deep geological disposal of radioactive waste investigations and petroleum engineering, Professor Young is exceptional in being able to move science from the laboratory into the engineered environment by identifying the applications of his research to real life situations with very positive social and economic outcomes. Earlier this year, Professor Young was elected as a Fellow of the Royal Society of Canada.

He is the first director and driving force behind the Lassonde Institute, an international centre of excellence for interdisciplinary research and graduate training, focused on engineering geoscience. The Institute draws on expertise in physics, applied mathematics, geology, geophysics, material science and engineering. His enthusiastic and inspirational leadership of multi-national and multidisciplinary research teams, as well as the work of his own research group on projects of global importance, has enabled others to access his research and technological innovation.

In a recent external review of the Department by academic leaders from MIT, Minnesota and McGill, the reviewers stated, "It would be hard to envision better leadership for the Department at this point in history." Professor Young has set the momentum for Civil Engineering to remain on an upward trajectory.

Pushing the Evolution of the Machine-Human Interface



[photo: CMC Microsystems]

Imagine a microchip that could detect and analyze brain waves. Now, imagine it implanted inside the brain. The potential for such a device is truly mind-boggling, as are the engineering challenges to design and build it.

This is one of the research projects of Professor Roman Genov, who heads the Intelligent Sensory Microsystems Laboratory in The Edward S. Rogers Sr. Department of Electrical and Computer Engineering (ECE). Genov and his collaborators have been widely hailed for their groundbreaking advances in developing a chip that could help in understanding how the brain works.

Creating a wireless, low-power chip with multiple sensors that have the computing

power to analyze brain activity is a goal that seems within the team's grasp. In addition, their work gives hope that some day a mini-computer implanted in the brain could detect, and perhaps control, abnormal brain activity. For those suffering from disorders such as epilepsy, it would be a dream-come-true: the ability to control seizures when drugs cannot help or result in serious side effects.

Genov's research team combines expertise in hardware, software and biology and includes graduate student Joseph Aziz, Professor Berj Bardakjian, of the Institute of Biomaterials and Biomedical Engineering and Toronto Western Research Institute and U of T electrophysiologist/neurologist Dr. Peter Carlen.

One of the reasons the team is making headlines is its answer to a key design challenge: minimizing heat buildup in the chip. Although the computing power of the team's chip compares to that of a Pentium processor – a chip that generates so much heat that it burns skin, if touched – their new chip performs without gaining more than one degree Celsius.

Another notable advance is that the new low-power chip can record neural activities in hundreds of locations at once. "We are among the top groups in the world in terms of electrical characteristics of the chip and the number of recording channels," Genov said.

Student Works For a Sustainable Energy Future



Barry Rawn, a PhD candidate in the Energy Systems Group, is one of many ECE students poised to make a difference in our energy future.

"I'd like to be an engineer that contributes to better informed energy policies," said Rawn, [EngSci OT2, elec. Option; MASc ECE 2004]. In addition to his current doctoral studies on how wind farms could provide ancillary services to the grid, Rawn's commitment to the environment has led to a wide range of volunteer activities.

A veteran of the Blue Sky Solar Racing Team and one of the founders of U of T's annual Sustainable Energy Fair, Rawn has continued to advise both groups. He has also worked with U of T's Sustainability Office to initiate a transition to biodiesel in our grounds-keeping vehicles and to conduct a campus wind resource assessment. "Projects like these give the opportunity to work with people from different disciplines," said Rawn.

Rawn hopes to leverage his power systems background in studying questions at the intersection of energy, economics, and the environment. He plans to pursue his interests in energy economics, the impacts of plug-in hybrids on the power system, the effects of carbon trading on electricity supply and demand, and the evolving role of renewables in the power grid.

His long-term goal? "I'd be interested helping to inform policy and develop new energy-related programs and initiatives at leading academic institutions," Rawn stated.

www.ecf.utoronto.ca/~rawn/

Engineering Science... engineers for the world.

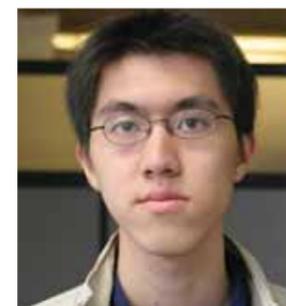


L to R: Shown at Machu Picchu, Peggy Li (OT6) and Ada Tsang (OT7) were two of three Engineering Science alumni who did volunteer work in Peru this past May. [photo: Yan Li]

EngSci alumni Max Gong (OT7), Peggy Li (OT6) and Ada Tsang (OT7) participated in a volunteer expedition to Peru this past May sponsored by the Global Youth Network. This Christian non-profit organization aims to develop leaders who are knowledgeable about the social, political and economic conditions in developing countries by sending university students to volunteer with local humanitarian organizations.

Through DEHUJANM, a Peruvian "NGO," Max, Peggy and Ada met and learned from local community leaders and visited community health centers, schools, women's rights organizations and a group advocating on behalf of working children. The students also worked with Una Familia, an organization that supports local development and building projects in Latin America. In Cai Cay, near Cuzco, Peru, they built a roof for a new education center intended to house a library and double as a residence for future volunteers.

Our students used their engineering skills to benefit local communities and gained a better understanding of the people and conditions in Peru.



EngSci Student Xin Wins U of T Award for International Students

Fourth year Engineering Science student Shi (Reynold) Xin is the 2007 recipient of the Jon S. Dellandrea Award for International Students. The award, given by the University of Toronto Alumni Association, recognizes students who contribute to the development of their peers. Xin is vice-chair of the U of T branch of IEEE and the founder of the new ECE student peer mentorship program, which pairs upper-year students with more than 350 frosh, to ease their transition into university. Reynold

Stefanie Covens: Meeting Business Challenges

Stefanie Covens, now in third year Engineering Science (computer option), was one of 32 Canadian post-secondary students selected for a national business and entrepreneurship competition held in Vancouver from June 26 to 29.

The competition, dubbed "Impact Apprentice," was held by "Impact," a student-run, non-profit organization dedicated to promoting entrepreneurship. The EngSci student passed three rounds of applications and was the only engineer and one of the youngest to be selected. Stefanie felt that her challenging Engineering Science program enabled her to compete on par with other participants, most of whom had business and management backgrounds.

"Impact Apprentice" teams faced real-life business challenges in sales, consulting and advertising, intended to test their leadership and teamwork skills. For example, Stefanie's team managed a TELUS store for a day. The result? Store sales increased by a whopping 355 per cent that day. Stefanie's team was successful in three out of the five challenges they faced and placed second in the others.



Stefanie is one of the Division's many talented students. In addition to a challenging academic schedule, she is a competitive dancer and figure skater, and last year acted as a choreographer for "Skule™ Nite," the Faculty's comedy show. She has also designed and fabricated a model home and an autonomous robot.

Professor Aarabi Chosen "Best Young Innovator"

A citation as "best young innovator" is the most recent of many honours bestowed on Professor Parham Aarabi of ECE. Premier Dalton McGuinty gave Aarabi the Premier's Catalyst Award at an April ceremony recognizing Ontario's top research talents. The award noted Aarabi's work in developing the ViewGenie system, enabling users to search a database of images or videos to locate objects based on visual content. www.apl.utoronto.ca/people/





Bridal Falls, B.C.
(photo: Prof. B. Karney)

A water fall symbolizes the sustaining value of the environment and the drama of energy conversion.

The environment provides us with the ability to generate power, live, work and grow. But at what cost? And how can the energy supply remain reliable and secure? Can we learn to better care for what has so long preserved us?

Such questions underline the integrated fabric of our life. Indeed, it is energy and the environment that together establish our society, infrastructure and lifestyle.

A New and Expanded Mandate to Address Critical Environmental Needs

So, what's new at the Division of Environmental Engineering? A new name, a new Chair, new programs, new collaborators – but little else!

On July 1, 2007, Professor Bryan Karney of Civil Engineering replaced Professor Phil Byer as Chair. During Phil's terms he launched new programs, forged new collaborations and guided students. Bryan hopes to build on this strong foundation by expanding the Division's leadership role in a variety of ways.

To this end, as of July 1, 2007, the Division expanded its teaching mandate and research towards an integration of both energy and the environment. This newly evolved Division of Environmental Engineering and Energy Systems (E3S) links two critical disciplines and aims to be a focal point for the campus, providing students with a more holistic education designed to meet today's pressing needs.

In the light of global change, resource depletion and a renewed appreciation that we live in a single world, we need to reconsider how we use energy. Energy systems are rapidly evolving, adapting to newer, stricter environmental ordinances. Thus, the Division will connect the environmental, social and economical ramifications of energy use and production in all engineering disciplines.

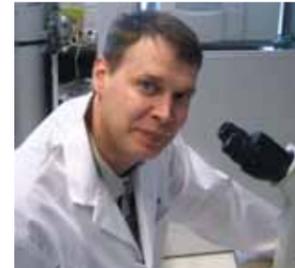
In an important sense, though, the core of the Division is unchanged. The overall focus is still on how to best preserve our environment and our economy within the constraints dictated by nature, technology and ethics. Solutions to such questions cannot be fragmented. Our courses must include both the technical necessities to understand energy infrastructure, as well as the larger natural context. To this end, two new programs will address repercussions and integrated impacts.

First, we are partnering with the Division of Engineering Science to introduce an exciting new "Energy Option" into the undergraduate program. Although this program will focus on electrical energy, it will broadly include policy, environmental and contextual issues. One of the proposed core courses, tentatively entitled "Terrestrial Energy Systems", will introduce the role and significance of energy conversion and storage for the planet Earth, including everything from solar inputs to energy redistribution through wind, ocean currents and waves. Second, we have proposed a flexible Energy and Environment "minor". All courses will stress the interconnections, tradeoffs and value of a holistic view of our resources, not focused on particular technologies, programs or policies.

Our expanded mandate rests on a vigorous commitment to interdisciplinary collaboration with the goal of creating an international presence that will attract and train talented and motivated students.

We'd love to hear your thoughts and ideas.

Tell us your reactions to this new vision. We also welcome quotes, websites or books that have inspired you, for our website: www.energy.engineering.utoronto.ca



(photo: Christina Thiele)

PETER ZANDSTRA AWARDED GUGGENHEIM FELLOWSHIP

Professor Peter Zandstra, whose research focuses on the development of novel stem cell-based therapies and technologies, was selected from a field of almost 2,800 applicants for the prestigious 2007 Guggenheim Fellowship Award. Scores of Nobel and other top prize winners appear on the 83-year-old roll of Fellows, appointed on the basis of distinguished achievement in the past and exceptional promise for the future.

Research in the Zandstra Laboratory is focused on the regeneration of functional tissues from stem cells and the development and utilization of tools to modulate the responses of these cells. Using a translational, bio-engineering-based approach to regenerative medicine, Dr. Zandstra's research seeks to develop cell-based therapies for diseases such as leukemia and heart disease.

Dr. Zandstra is cross-appointed to the Departments of Chemical Engineering and Applied Chemistry and Medical Genetics. He is the Canada Research Chair in Stem Cell Bioengineering and has also received the Premier's Research Excellence Award and the E.W.R. Steacie Memorial Fellowship.



(photo: Mike Cassese, Caswel Photos)

Professor Tom Chau Named to Canada's 'Top 40 Under 40'

Professor Tom Chau was one of four U of T professors named this year to "Canada's annual Top 40 Under 40," a national list honouring high-achieving Canadians who have not yet reached the age of 40. The program is run by the Caldwell Partners and published in *The Globe and Mail* each spring to recognize contributions made to the advancement of knowledge and the greater good of society.

Chau's research focus is pediatric rehabilitation engineering, helping to improve the lives of children with disabilities. A scientist at Bloorview Kid's Rehab, as well an IBBME professor, Chau leads a multidisciplinary team of educators, physiotherapists, nurses, physicians and engineers in creating ingenious tools to help physically challenged children to control their environment, play or communicate. For example, Chau has developed a revolutionary prosthetic arm triggered by the faint sounds of a child's arm muscles and a system that allows children with motor disabilities to play music.

Dr. Chau was also named to *Maclean's* magazine 'Honour Roll 2006: Discoverers and Thinkers' and chosen in 2005 as a Professional Engineers Ontario medalist.

RECENT NEWS

NEW LEADER FOR IBBME

Professor Christopher Yip (Chem 8T8) was appointed as IBBME's Interim Director, commencing July 1, 2007. He replaces former Director, Professor Ross Ethier, who was appointed Professor and Head of the Bioengineering Department of Imperial College in London, U.K. after two years at the helm of IBBME. During the 2007/08 academic year, there will be a search for the position of Director.



(photo: Camelia Linta)

Professor Yip was appointed in 1997 to IBBME, as well as to the Department of Chemical Engineering and Applied Chemistry and the Department of Biochemistry. He is one of IBBME's "core" faculty members, a Canada Research Chair in Molecular Imaging, and part of the UT NANOnetwork. His expertise is in molecular self-assembly, scanning probe microscopy and molecular materials. His collaborative research may ultimately help address how the body responds to new drugs and therapies.



(photo: Pascal Paquette)

GENEROUS DONORS ESTABLISH TWO NEW STUDENT AWARDS

A gift from Frank Milligan (Mech 4T8), founder and Chairman of Thermal & Hydraulic Equipment Limited, a distributor of industrial machinery, will fund

20 graduate fellowships in the Department of Mechanical and Industrial Engineering and IBBME.

The first recipients of the Barbara and Frank Milligan Graduate Fellowships are PhD candidate Tilak Dutta and MASC candidate Brian Leung. Milligan hopes the gift will help attract talented students. "When you think of all the medical procedures that are now possible, it's partly thanks to work by engineers," he stated.

Professor Paul Wang, a retired IBBME faculty member noted for his important contributions to diabetes research, has established the Sally and Paul Wang Distinguished Graduate Scholarship. The inaugural recipient is Victor Wong, a PhD candidate in the Department of Physiology.

Honouring Pierre Rivard, Hydrogenics' Founder



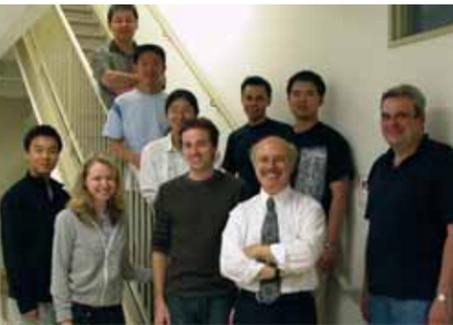
(photo: Courtesy Hydrogenics Corporation)

THE NEW PIERRE RIVARD HYDROGENICS GRADUATE FELLOWSHIP WILL BE OPEN TO GRADUATE STUDENTS REGISTERED IN THE FACULTY'S DEPARTMENT OF MECHANICAL AND INDUSTRIAL ENGINEERING WHO ARE ENGAGED IN ALTERNATIVE ENERGY RESEARCH.

Cited as a Technology Pioneer at the 2004 World Economic Forum, Hydrogenics Corporation is a globally recognized developer and provider of hydrogen generation and fuel cell products and services. The firm was launched in 1995 with just three employees and a dream: to be at the forefront of a global economy based on hydrogen.

To thank the firm's outgoing Executive Chair, Pierre Rivard (MEng Mech 9T4), Hydrogenics recently established a fellowship in his honour. Daryl Wilson (Chem 8T2), Hydrogenics' current President and CEO, stated that the new Pierre Rivard Hydrogenics Graduate Fellowship will be open to graduate students registered in the Faculty's Department of Mechanical and Industrial Engineering who are engaged in alternative energy research. Rivard was one of three founders of Hydrogenics in 1995 and held the position of President and CEO until December 2006. He led the company's growth to 250 employees, with four operations sites in three countries.

Professor Mandelis receives inaugural Premier's Discovery Award



(photo credit: Alexandra Mandelis)

Professor Mandelis, an applied physicist and instrumentation scientist of international renown, was recently honoured with the 2007 Premier's Discovery Award in the Natural Sciences and Engineering category, based on three decades of prolific and diverse research in areas including energy, environmental engineering, manufacturing, materials and thermal sciences.

Mandelis has been instrumental in defining the discipline of diffusion wave science and extending its boundaries for an extraordinary range of practical uses. Dr. Mandelis co-developed photopyroelectric spectroscopy, a thermal wave technique now a standard used worldwide in physics, chemistry and engineering and in practical applications including food science, semiconductor properties, material science and agricultural and environmental monitoring. Dr. Mandelis is currently at work on depth-selective bioacoustophysics, a novel tissue imaging technology that is showing promise for deep subsurface localization and early tumor monitoring.

He has also developed new, solid-state gas sensors for monitoring environmental pollution, primarily for hydrogen, hydrocarbon and helium trace gas detection, to ensure safe hydrogen energy production and utilization.

Student Works in Ghana to Make Lives Better

Sean Poynton, a second year Mech student, spent the summer as a volunteer with the U of T chapter of Engineers Without Borders (EWB), working in northern Ghana. His trip was sponsored in part by the Engineering Alumni Association.

Sean applied his engineering skills to three projects aimed at making life in the rural community better. For the "Community Initiative for Food Security" funded by the Canadian International Development Agency, he traveled to 15 different communities within the District of East Mamprusi to assess local needs in health, education, water, sanitation and food security, as part of a district plan. He also coached several members of the District Planning and Coordinating Unit in effective meeting management, presentation skills and computer training. In addition, Sean created a monitoring and evaluation baseline to be used in evaluating the success of development programs in the area.



(photo credit: Steven Ngota)

New Directions in Materials Science Engineering

Building on a strong history of studies in metallurgy and materials science, our Department is evolving to encompass exciting new areas of study. This article focuses on nano-engineering, a field of continual growing interest.

Bio-Inspired Nano-Structures

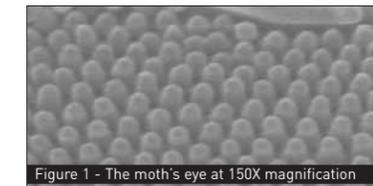


Figure 1 - The moth's eye at 150X magnification

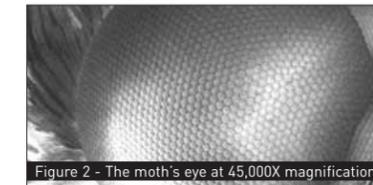


Figure 2 - The moth's eye at 45,000X magnification

Scanning electron micrographs of the eye of a moth (photo credit: J. Victor-Beale, T. Ying and U. Erb, 2005)

Nanotechnology researchers are increasingly mimicking solutions developed and perfected for eons by nature in many living organisms. Professor Uwe Erb is examining a large number of biological species for clues on how nature's solutions might be applied to engineering problems. For example, Figure 1 shows the faceted eye of a moth, seen at low magnification (150X) in scanning electron microscopy (SEM). In figure 2, at higher magnification (45,000X), thousands of these facets or protrusions, each ~ 200 nm in diameter are seen. These protrusions decrease light reflection, and improve night-vision. Erb has recently applied this principle of generating nanoscale roughness on surfaces to make antireflective polymer and glass surfaces.

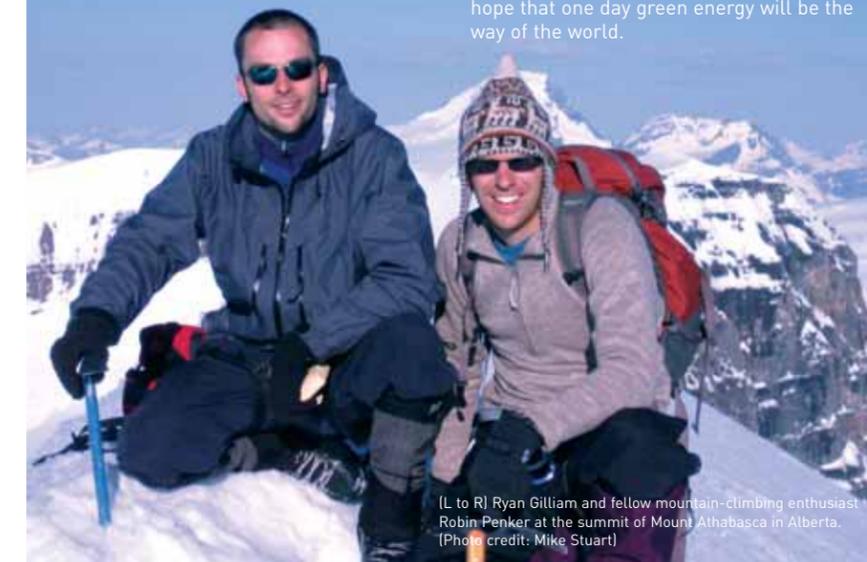
Seeking Alternative Energy Answers

Ryan Gilliam, a PhD candidate supervised by Professors Steven Thorpe and Donald Kirk, is contributing to the quest for low cost, clean, efficient energy.

Gilliam's work focuses on hydrogen fuel cell technology. By synthesizing nanotube and nanowire catalysts, he relates microstructural and geometrical characteristics to catalyst performance. He hopes to maximize use of catalysts within fuel cell systems to bring the technology one step closer to fruition.

Aside from his lab work, Gilliam has expressed his strong commitment to the environment and alternative energy through teaching and writing. For the non-profit Council on World Affairs of Canada, which educates Canadian youth about global issues, Gilliam has written study guides and facilitated committees on global warming and energy security. This summer, he taught a course on alternative energy sources to high school students in the Faculty's Da Vinci Engineering Enrichment Program (DEEP).

Gilliam intends to work in the field with the hope that one day green energy will be the way of the world.



(L to R) Ryan Gilliam and fellow mountain-climbing enthusiast Robin Penker at the summit of Mount Athabasca in Alberta. (Photo credit: Mike Stuart)

HYBRID NANO-STRUCTURED MATERIALS



(L to R) Prof. Glenn Hibbard and MSE PhD candidate Brandon Bouwhuis (EngSci OT3 + PEY, Nano Option) at Toronto's Integran Technologies Inc. holding hybrid trusses. (Photo credit: Eral Bete)

New types of lightweight structural materials are needed to reduce the energy requirements of the transportation industry. Professor Glenn Hibbard's research group is developing a hybrid nano-structured material that combines the best of two very different materials design strategies to achieve a breakthrough in light-weight materials design. In the first approach, a low density material (e.g. less than five per cent of the parent metal) is created by forming a regular internal void structure. These periodic cellular materials are designed to retain only that part of the material which has a geometrically-high load-bearing efficiency (i.e. a micro-truss material). The second design strategy takes advantage of the enormous strength increases that result from reducing the length-scale of the crystalline building blocks to the nanometre-scale. The large volume fraction of grain boundaries in these materials prevents plastic deformation, considerably increasing the yield strength. Integran Technologies Inc. is supporting this research.

NANO-ELECTRONICS

Demand is growing for increasingly smaller micro-electronic devices yet, current device sizes (65nm) are edging closer to physical barriers will be impossible for conventional transistor technology to be scaled smaller: a new paradigm is needed.

Professor Jun Nogami's group is investigating the use of atomic templates to make nanowires with a width of only 3nm that could be a component of a future nanotransistor, or a smart, light sensitive device. Potential applications are in lighting, x-ray imaging and sensors.

ENERGY EFFICIENT LIGHTING

Professor Zheng Hong Lu is renowned for his work on organic light emitting diodes (OLEDs) which hold great promise for energy-efficient lighting and flexible displays.

Lu's MASc student Yiqun Zhao is currently investigating a new solution to produce robust and highly conductive charge transport materials for OLEDs application. Zhao is working on applying C60:LiF nano-composites, developed by vapour phase deposition, as electron transport materials (ETMs) in OLEDs. As compared to conventional ETMs, C60:LiF composites are extremely conductive, enabling the electrons and holes to be balanced in the device, thus resulting in increased power efficiency.



(image: Prof. J.R.R.A. Martins)

New Directions for UTIAS

In our strategic planning at UTIAS several years ago we asked: What are the key improvements needed in future civil aircraft? How will future aircraft differ from those currently flying? What is the primary driver for change in the design and technology of aircraft? We believe the answers to be very clear. Future civil aircraft must have a greatly reduced impact on global warming.

Aircraft contribute to climate change through emissions of carbon dioxide and oxides of nitrogen as well as through contrails (condensation trails). The current contribution from civil aviation is estimated at roughly 3.5 per cent of all man-made greenhouse gas emissions, with an impact two to four times greater as a result of the altitude at which aircraft emissions occur.

Some say we should stop flying, but the current contribution from aviation is not large enough to justify this extreme measure. Others say that this small contribution can be ignored for now, while we address greater contributors to climate change. This, too, is wrongheaded. Air travel is projected to grow continuously over the next two decades, and it takes many years to introduce new technology in civil aviation. **Therefore, the time to invest in new research and technology to reduce the contributions of aviation to climate change is now!** Reducing the impact of aircraft on climate change has become the primary focus of the aeronautical research at UTIAS.

What are some possible technological solutions to reduce the effect of aviation on climate change? Please stay tuned – we will discuss some potential solutions in the next issue of Skulematters.

Calling All Aerospace Alumni

We are starting an alumni registry on our website dedicated to graduates of the Aerospace Option of Engineering Science and UTIAS.

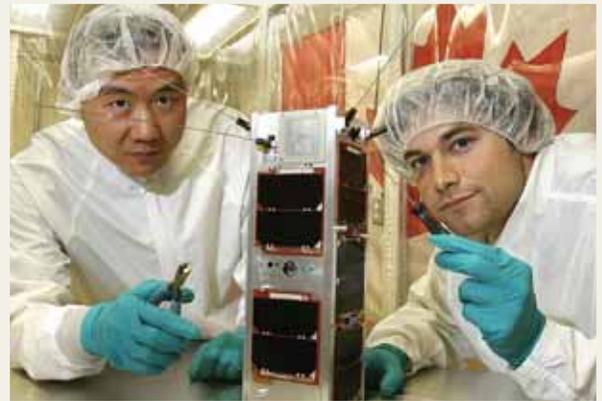
Join the alumni registry and look for upcoming events on our website:

www.utias.utoronto.ca

NEW LOW EMISSION ENGINE TECHNOLOGY FOR AIR TRANSPORTATION

UTIAS Professors Ömer Gülder and Clinton Groth have begun a new initiative to demonstrate an innovative, low-emission technology for gas turbine engines used in aviation. The technology has the potential to simultaneously deliver major reductions of nitrogen oxides, carbon monoxide, volatile organic compounds and particulates, as well as reduced greenhouse gas emissions – a feat previously thought to be impossible in medium and small jet engines. This work will be done in conjunction with a consortium funded by Sustainable Development Technology Canada (SDTC). Along with UTIAS, the consortium includes Pratt & Whitney Canada, National Research Council, Goodrich Corporation's Turbine Fuel Technologies Division, Hamilton Sundstrand Corporation, United Technologies Research Center, and INCO Ltd.

NANOSATELLITE TO DETECT ORIGINS OF GREENHOUSE GAS EMISSIONS



(photo: Steve Behal Photography)

The UTIAS Space Flight Lab (SFL), under the direction of Dr. Robert Zee, is preparing for a Fall launch of CanX-2, a nanosatellite weighing 3.5 kg. The launch marks the third satellite built and launched by the SFL, as the lab continues to push the envelope on complex missions of micro and nanosatellites. Four other Canadian universities are providing the science payloads for CanX-2, which include the smallest atmospheric spectrometer manufactured to date. The spectrometer will detect concentrations of greenhouse gases and will be able to localize the source of the emissions to within one square kilometre. **www.utias-sfl.net**

WELCOMING PROFESSOR TIM BARFOOT

UTIAS is pleased to announce the addition of Dr. T.D. Barfoot to its faculty as an Assistant Professor. Dr. Barfoot previously worked in the Controls and Analysis Group at MDA Space Missions. Professor Barfoot received his B.A.Sc. in aerospace engineering at U of T and completed his PhD at UTIAS. His current research is in the area of estimation and control for planetary rovers.

{contents}

1 Welcome from the Dean

2 Our Energy Future

With energy so fundamental to our way of life, there will be both the pressure to change and the premium to pay for it.

4 Oilsands Innovator: Dr. Columba Yeung

Yeung's proprietary technology has been described as the most energy-efficient, environmentally friendly and cost-effective method developed to date to extract and refine bitumen from Alberta's oil sands.

6 Grad's Work Powered by the Sun

How high temperature processes could be run with concentrated solar radiation as the source of heat.

7 German Fellowship Supports Star Solar Researcher

Dr. Yanyan Yuan was recently awarded a prestigious one-year fellowship from the Alexander von Humboldt Foundation.

8 Engineering with a Purpose

Tim Christie's passion for making the world just a bit better has taken him to some of the earth's hottest and coldest climates and into its depths.

9 Living Fully with Lower Energy Consumption

Hyde raised money to develop and pilot the Protocol.

10 Alumni News

12 Student News

13 Faculty News

14 Class Notes

15 Skule™ Memories

25 In Memoriam

In Memoriam

It is with regret that we have learned of the deaths of the following Skule™ graduates.

We would like to honour each graduate by telling their story and we hope you will help. Send us your stories, your memories, and your photos for our new Skulematters website: www.skulematters.engineering.utoronto.ca. To submit your story, email us: alumnews@ecf.utoronto.ca or fax: 416-946-3450.

2T6 Civil
Leonard Grime
(Died January 5, 2007)

5T0 Civil
David Harvey Landells
(Died 2006)

3T5 Mech
Wilmot James Blackhall
(Died January 13, 2007)

5T3 Industrial
Paul Greenan
(Died May 29, 2007)

3T6 Mech
John Charles Millson
(Died April 25, 2007)

5T8 Mech
John W. Halonen
(Died July 9, 2007)

3T8 Mech
Albert Ellis King
(Died June 22, 2007)

6T0 Civil
Arthur B. Johns
(Died October 24, 2006)

3T9 Metallurgy
Raymond Leigh Cavanagh
(Died March 2007)

7T0 Civil
Joseph P. Grieco
(Died May 17, 2007)

3T9
Paul Bernard Dilworth
(Died February 18, 2007)

8T3 Industrial
Pamela Selby Eden
(Died February 5, 2007)

4T4 Chem
Ignatius Lloyd MacDonald
(Died December 14, 2006)

FACULTY MEMBERS

4T9 EngSci, MA 5T0, PhD 5T2
Dr. Grant Edison St. John
(Died February 3, 2007)

Chem
Professor Emeritus Ronald W. Missen
(Died March 31, 2007)

Chem
Professor Emeritus Diran Basmadjian
(Died December 28, 2007)

To notify us of a death of one of our graduates, please email: address.update@utoronto.ca. We apologize if we have printed any inaccuracies.

Powered
by the
sun
p.6

Department,
Division
and
Institute Updates
p.16-24

Events
Calendar
back cover

Skulematters is published twice annually by the Faculty of Applied Science and Engineering at the University of Toronto for alumni, faculty, students, staff and friends of Skule™.

[EDITOR]
Kate Brand

[MANAGING EDITOR]
Ruth Weinstock

[EDITORIAL BOARD]
Dean Cristina Amon
Vice-Dean Stewart Aitchison

Vice-Dean Grant Allen
(Chem 8T1; MASC 8T3)
Kate Brand

Sonia De Buglio
(Chem 9T4; MASC 9T8)
Barry Levine (Ind 8T4)

Vice-Dean Brenda McCabe
(Civ 9T4)
Ruth Weinstock

[CONTRIBUTORS]
Sharon Brown
Jan Carr (ECE 6T8)

Lindsay Cunliffe
Joan De Costa
Shilpa Gantotti

Susan Grant
Sabrina Hoque

Sheema Inayatulla
Betty Lin (MSE 0T3; MASC 0T5)

Liam Mitchell
Shannon Osborne (Ind 0T6)
Lisa Simpson-Camilleri

Pauline Smith
Andrew Stelmacovich
Christine Ward

Georgette Zinaty

[DESIGN]
DUO Strategy and Design Inc.

[PRINTING]
General Printers

Privacy: The University of Toronto respects your privacy. We do not rent, trade, or sell our mailing lists. If you do not wish to receive this publication, please contact: address.update@utoronto.ca or 1-800-463-6048, local to Toronto: 416-978-2139.

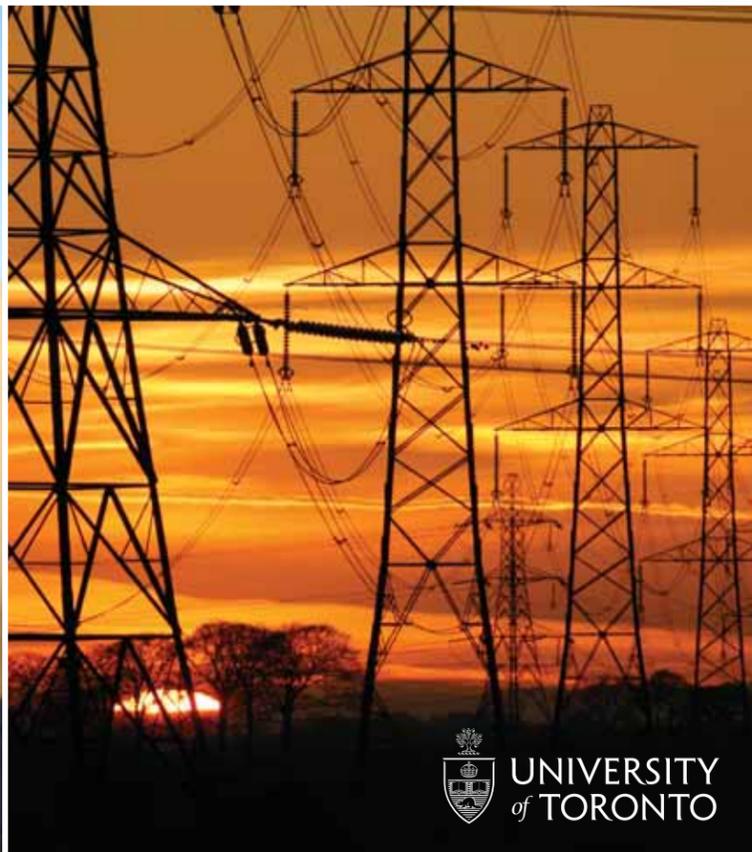
We invite your letters, submissions, news, comments, and address changes.
Please email: kate@ecf.utoronto.ca

Skulematters fall '07

Faculty of Applied Science and Engineering University of Toronto

AFFECTING CHANGE WITH GREAT ENVIRONMENTAL AND ECONOMIC RESULTS

energy



EVENTS | CALENDAR

NOVEMBER, FEBRUARY, MARCH

9:30 a.m. on Thursdays and Fridays
Tour the Engineering Complex
Open to the general public
Galbraith Building Room 173, University of Toronto
www.engineering.utoronto.ca or call 416-978-3872

NOVEMBER 3

Robotics Symposium – Level 2
Students in grades 9 - 12
www.engineering.utoronto.ca



NOVEMBER 8

Alumni Awards Banquet
Open to Engineering alumni and friends
89 Chestnut Street, University of Toronto

NOVEMBER 17

11 a.m. – 3 p.m.
University of Toronto Engineering Graduate Studies Fair
Galbraith Building Lobby, 35 St. George Street, University of Toronto

NOVEMBER 18

Pre-Santa Claus Parade
Open to Engineering faculty, staff, alumni, family and friends

NOVEMBER 23

7 p.m.
Skule™ Music Concert featuring the Orchestra, Stage Band Combo, and Brass Ring.
Great Hall, Hart House, University of Toronto
For more info: music.skule.ca

NOVEMBER 28

Skule™ Mentorship Program: Career Nite/Professional Networking Event
Open to anyone involved in the Skule™ Mentoring Program
For more info: www.engineering.utoronto.ca/informationfor/alumni/volunteer/mentorship

NOVEMBER 30

Engineering 4 Educators
All high school educators
University of Toronto
www.engineering.utoronto.ca

WINTER AND SPRING

Professional Development Centre Course begins: Building Science
See Course Outline
University of Toronto
www.pdc.utoronto.ca

WINTER AND SPRING

Professional Development Centre Course begins: Business Analysis
See Course Outline
University of Toronto
www.pdc.utoronto.ca

WINTER AND SPRING

Professional Development Centre Course begins: Electronic Communications Management
See Course Outline
University of Toronto
www.pdc.utoronto.ca

WINTER AND SPRING

Professional Development Centre Course begins: IT Service Management
See Course Outline
University of Toronto
www.pdc.utoronto.ca

WINTER AND SPRING

Professional Development Centre Course begins: Physical Asset Management
See Course Outline
University of Toronto
www.pdc.utoronto.ca

WINTER AND SPRING

Professional Development Centre Course begins: Project Management
See Course Outline
University of Toronto
www.pdc.utoronto.ca

JANUARY, FEBRUARY

Professional Development Centre Course begins: PRINCE2™, or Projects IN Controlled Environments, Project Management Courses
See Course Outline
University of Toronto
www.pdc.utoronto.ca

JANUARY 10

9:30 a.m. – 3:30 p.m.
Civil and Mineral Engineering Career Fair
Civil and Mineral alumni and friends
University of Toronto
For more info contact Nelly Pietropaolo: nelly@civ.utoronto.ca or 416-978-0235

JANUARY 23

Professional Development Centre Course begins: LEED® Leadership in Energy and Environmental Design (LEED) Green Building Rating System™ Course
See Course Outline
University of Toronto
www.pdc.utoronto.ca

JANUARY 24

Skule™ Mentorship Program Dining Etiquette
Open to anyone involved in the Skule™ Mentoring Program
For more info: www.engineering.utoronto.ca/informationfor/alumni/volunteer/mentorship



FEBRUARY – APRIL

DEEP Summer Academy Registration
Students in grades 9 - 12
University of Toronto
www.engineering.utoronto.ca

FEBRUARY 12

Skule™ Mentorship Program Student Presentation Nite
Open to anyone involved in the Skule™ Mentoring Program
For more info: www.engineering.utoronto.ca/informationfor/alumni/volunteer/mentorship

MARCH

March Break Applicant's Event
Open to applicants and their families
University of Toronto
Look for more details online, in March: www.engineering.utoronto.ca

MARCH 12-15

Skule™ Nite
Open to the general public
Hart House Theatre, University of Toronto

MARCH 12

Alumni Skule™ Nite Reception Honouring our Mentorship Program
Open to Engineering alumni and friends and anyone involved in the Skule™ Mentorship Program

MARCH 14

6 p.m.
23rd Annual Chemical Engineering Dinner
Open to Chem alumni and friends
89 Chestnut Street Residence, University of Toronto
www.chem-eng.utoronto.ca

MARCH 29 – MAY 10

Saturday Science and Engineering Academy Registration
Students in grades 3 – 12
University of Toronto
www.engineering.utoronto.ca

MARCH 31

Professional Development Centre Course begins: Facilities Management Certificate Course
See Course Outline
University of Toronto
www.pdc.utoronto.ca

APRIL 4

6 p.m.
EngSci Alumni Dinner
Open to EngSci alumni and friends
Great Hall, Hart House, University of Toronto
www.engsci.utoronto.ca

MAY 8 – 12

RobotX
Students in grades 9 - 12
University of Toronto
www.engineering.utoronto.ca



MAY 29

Skule™ Annual Golf Classic
Open to Engineering alumni and friends

MAY 30

12 p.m. – 2 p.m.
Chemical Engineering Reunion Lunch Honouring Classes of 5T8 and 8T3
Open to Chem alumni and friends
Wallberg Building, Chem Eng Undergraduate Common Room 238, 200 College Street
www.chem-eng.utoronto.ca
Free for Chem grads

MAY 30

Spring Reunion Dinner Dance Honouring Classes of 5T8 and 8T3
Open to Engineering alumni and friends
89 Chestnut Street Residence, University of Toronto

MAY 31

Hall of Distinction Unveiling
Open to Engineering alumni and friends
2nd Floor, Sandford Fleming Building, University of Toronto

MAY 31

4 p.m.
Chem Eng Class of 7T8 30th Anniversary Reception and Dinner
Open to Chem alumni and friends
U of T Faculty Club, 41 Willcocks St.
For more information: amiel@lorama.com or joedersose@sympatico.ca or rpateron@aspateron.com

SUMMER

Sci Camp
Students in grades 1-6
All 3 U of T campuses and 12 other GTA locations
www.engineering.utoronto.ca



SUMMER

Jr DEEP
Students in grades 7-8
All 3 U of T campuses and 12 other GTA locations
www.engineering.utoronto.ca