

Dean's Report

New public policy thrust for McGill Engineering

Sustainability think tank created



SEAN SALUSBURY

Mechanical Engineering Professor Jeff Bergthorson

Bergthorson is one of three dozen professors at McGill Engineering whose research encompasses aspects of sustainability. He is seen here in the Macdonald Engineering Building's Alternative Fuels Laboratory analyzing how biofuels can be used to power next-generation engines. The work Bergthorson and his colleagues are doing will inform other research about how best to integrate alternative fuels into transportation and power-generation systems, and help to develop new engine designs that improve efficiency and reduce emissions.

A major initiative has been launched that will give our Faculty's professors and students a powerful vehicle to influence public policy in the area of sustainable engineering and design.

A \$10-million gift from alumnus Lorne Trottier, BEng'70, MEng'73, DSc'06, and his family will fund an institute that will broaden our students' knowledge and serve as an influential, independent, fact-based think tank to better inform and educate decision-makers and the public about sustainability issues.

The Trottier Institute for Sustainability in Engineering and Design—TISED for short—builds on an existing sustainability endeavour called ISEAD (the Institute for Sustainability in Engineering and Design),

which was launched in 2010 with support from alumnus Ram Panda, MEng'71, MBA'77. All of ISEAD's programs and activities will be incorporated into the new, broader-based Trottier Institute.

"Science and technology form the basis of our societies," Trottier says, "so the public should have a solid appreciation and understanding of them. As part of that effort we have to do more to inform people about current and future sustainable practices."

Interim Dean of Engineering Andrew G. Kirk says that "adding a public policy dimension to our work will enable McGill Engineering to move into areas well beyond our existing sustainability institute's mandate. The resources provided by the Trottier gift will make

McGill Engineering a leading player in sustainability engineering practices—in Quebec, across Canada and, as much as possible, abroad. I am confident that the new institute will influence work being conducted at other universities and impact substantially on federal and provincial government agencies and departments."

As part of its mandate TISED will forge a partnership with Montreal's École Polytechnique, where Trottier has endowed a similar institute that will focus on sustainable energy practices. Collaboration between the two engineering schools will include an annual public symposium to focus attention on the relevance of sustainable engineering and ▶ (see Sustainability page 3)



Dean's Message

Most people typically associate the word "growth" with volume or size, as evidenced by the article in this newsletter about the growing size of the professoriate at our Faculty.



Growth can equally be interpreted to mean "depth", however, and increased depth is one of the many positive results that flow to McGill Engineering through alumni donations.

Recent gifts in areas such as sustainability, innovation, entrepreneurship and teaching have significantly broadened McGill Engineering's ability to provide students with enhanced skills to meet 21st-century challenges.

As educators we have to cope with an ever-changing landscape in deciding how best to prepare graduates for the evolving realities of life outside the classroom, and alumni support remains key in enabling our Faculty to adapt fundamental teaching and research principles to meet these new demands.

Remaining relevant

We are proud of the quality of our programs, and we continue to receive high marks from most of our students, but we know that that we must remain vigilant to maintain our competitive position alongside other top schools.

Our classrooms, our laboratory facilities, the types of advising and counselling we provide, and the nature of the contacts we maintain with industry and professional associations are all analyzed and critiqued through the prism of what happens elsewhere.

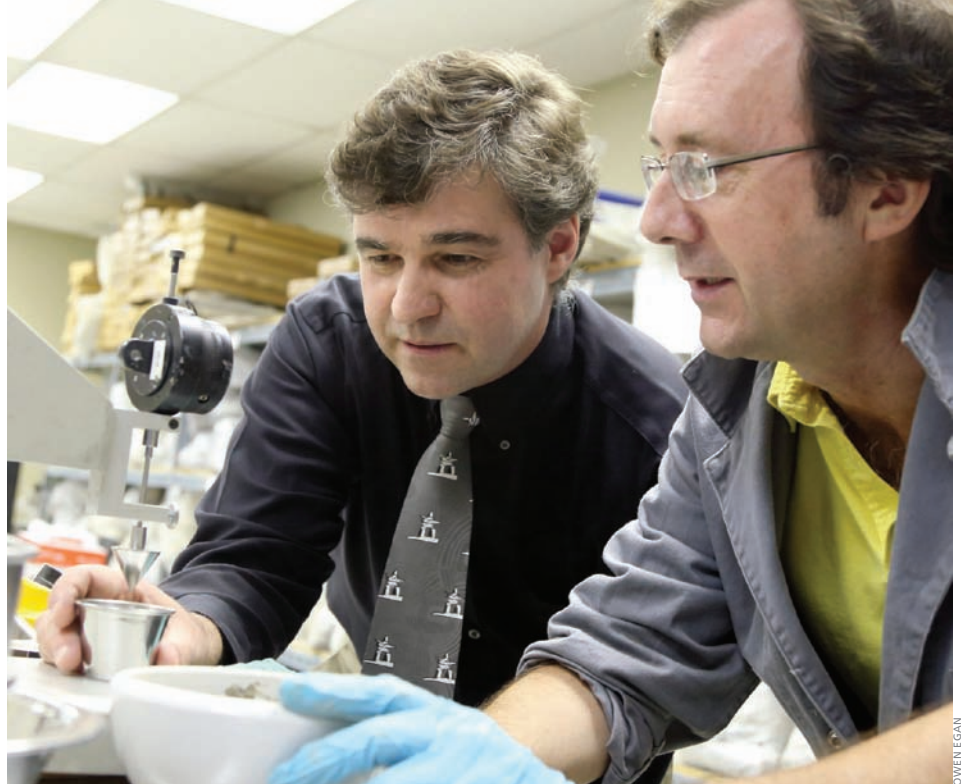
In an era of declining government support, alumni gifts—both big and small—are essential to ensure that our Faculty's work remains relevant, that our programs are judged first-in-class and that our reputation is considered well above par.

Your past support has brought us to where we are; your future support will lead us to new heights.

Thank you for all that you do.

Andrew G. Kirk
Interim Dean

The **Alma Mater Fund** is the lifeblood of McGill Engineering



Lab technician Daniel Bayard (right) briefs alumnus Dominic Bergeron at a Groupe ABS testing facility in Ville d'Anjou, Quebec.

Annual gifts to the Alma Mater Fund are essential in helping McGill Engineering to grow and develop. Each gift serves as a building block to spur innovation and maintain excellence.

Dominic Bergeron, BEng'87, is a loyal alumnus who understands this concept. He has been an annual donor for 25 years.

The native of Sorel-Tracy (east of Montreal) had his pick of universities, but he chose McGill Engineering for two reasons: to master his English-language skills and because of McGill's international reputation. A quarter-century later, he has no doubts he made the right decision.

"Having 'McGill' on my CV got me my first job—with Domtar—and I know it's played an important role each time I applied for positions after that. Our university is known all over the world, and I guess the main reason I'm an annual donor is to do my part to help ensure that McGill remains one of the best."

His current position is Director of Special Projects at the Montreal-based consulting firm, Groupe ABS. Among other services, the company conducts compliance audits to determine if its

clients' operations meet government regulations and industry standards.

Bergeron himself specializes in environmental site assessments—everything from soil and groundwater characterizations to site remediation and environmental management.

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"I am where I am today largely because of what I learned at McGill Engineering."
.....

The Mechanical Engineering graduate is one of a small group of alumni who started giving back their first year after graduation. He has increased that initial \$20 donation every year since, and is now one of the 1 per cent of Engineering Faculty graduates known as Leadership Donors. In Bergeron's case, he is a member of the Deans' Circle.

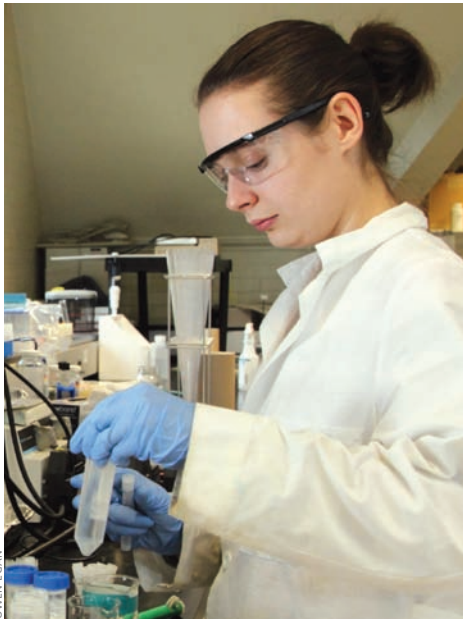
"I am where I am today in large part because of what I learned at McGill," he says, "so I've adjusted my yearly Alma Mater Fund gifts to reflect my actual income."

Bergeron says he didn't benefit personally from ► (see *The Alma Mater Fund* page 6)

design to people's lives.

The symposium's themes will be determined by McGill Engineering one year and École Polytechnique the next. The venue for the event will also alternate between the two campuses. Trottier, co-President of the Quebec-based computer graphics firm, Matrox Electronic Systems Ltd., says cooperation between the two schools "will help to secure Montreal's place as a driver of research and discovery in the critically important area of sustainability."

McGill Engineering's new think tank will publish white papers on global sustainability issues and on topics related to federal and provincial sustainability policies. TISED will work with other McGill units, Canadian and international



Environmental Engineering Master's student Miriam Lebeau is researching processes that could transform liquid waste into value-added by-products.

universities, relevant professional bodies and federal and provincial government agencies and departments to promote informed discussion in the field.

Funds from the Trottier gift will be allocated in ways that benefit professors, graduate students and undergraduates alike. The diverse elements of the gift include an Endowed Chair; a Scholars-in-Residence program; administrative support for teaching and research projects; Faculty Scholar Awards to attract and retain outstanding junior professors; master's and doctoral fellowships; Summer Undergraduate Research in Engineering (S•U•R•E) Awards; and support for undergraduate student competitions and design projects.

It will take approximately five years for the Trottier Institute to become fully operational. The official launch is scheduled for mid- to late spring.

Benchmarks for success

At a time when each dollar Quebec universities spend is being rigorously scrutinized, both Trottier and the Faculty have taken exceptional care to prepare a balanced five-year budget. No infrastructure costs are foreseen, for example; TISED will be housed in space originally provided for the Institute for Sustainability in Engineering and Design. Precise benchmarks were also agreed upon to assist in the institute's management and to help gauge TISED's short- and long-term success.

In addition, part of the Trottier gift has been set aside as leverage funding—a strategy to attract matching support from other generous donors to support various areas of TISED's mandate.

With files from Patrick McDonagh



Professor Marianne Hatzopoulou

Another researcher working in the area of sustainability is Civil Engineering and Applied Mechanics Professor Marianne Hatzopoulou. She has wide-ranging research interests, but a common theme of her work is supplying accurate data to elected officials and other policy-makers to enable them to make informed decisions.

She leads an interdisciplinary team of engineers and health scientists that was recently awarded a three-year, \$450,000 Collaborative Health Research Projects grant from the federal government. The team will examine means to reconcile the divide between urban policies that promote active transportation, and health objectives which call for minimizing the exposure of Canadians to air pollution.

Trottier matching funds double his gift's impact

The matching funds included in Lorne Trottier's exceptional \$10-million gift to the Faculty of Engineering are an incentive to encourage new donors, or existing supporters who want to increase their giving, to establish named endowments that will generate income in perpetuity to strengthen our Faculty's programs and services.

By taking advantage of matching funds, alumni and friends can double the impact of their contributions, thereby

helping the ultimate beneficiaries—current and future generations of McGill engineering, architecture and urban planning students.

Any endowment that benefits from matching funds is named after the individual who establishes the endowment, not the donor who provided the matching funds.

In the case of the new sustainability institute, Trottier has set aside \$1.25-million worth of matching funds to

encourage other donors to pay for Faculty Scholar Awards, graduate fellowships, Summer Undergraduate Research in Engineering (S•U•R•E) Awards and student design competitions.

If you would like more information about the Trottier Matching Funds program, please contact McGill Engineering Development Director Krish Dasgupta at 514-398-2016 or krishanu.dasgupta@mcgill.ca

The Trottier gift has two underlying purposes: to enable McGill Engineering to provide intellectual leadership in the area of sustainability and to promote university outreach and public interaction.

During discussions with alumnus Lorne Trottier it became clear that he and the Faculty shared a common vision of how his gift could enable McGill Engineering to contribute more meaningfully to an understanding of sustainability.

- The Trottier gift will provide administrative support to help professors in numerous areas of teaching and research. Specifically, it will help them to obtain matching funds from external sources; form partnerships with industry, national laboratories and foundations; work with other Quebec universities, such as École Polytechnique, to develop joint programs; share best practices;

Sustainability will be one of engineering's main themes in the 21st century

promote student interaction and choose research areas with a public policy dimension. Particular attention will be paid to the work of junior faculty—rising stars with the potential to make important contributions.

- Priority research areas have been identified, too: energy (particularly renewable energy with a strong focus on

electricity); photovoltaics and clean combustion; sustainable manufacturing; green information technologies; green aviation; sustainable urban transport; and urban development.

- In terms of undergraduate education the Trottier funding will complement current and planned initiatives to help ensure that sustainable engineering components are present in all undergraduate programs. There are plans to develop a Minor in Sustainable Engineering, new Impact of Technology courses and pilot projects and case studies to help professors incorporate sustainable engineering concepts into their teaching and research.
- The benefits for graduate students include a proposed Professional Master's Degree in Sustainable Engineering and activities to enable TISED Fellows to interact as a true community of scholars.



An exceptionally committed alumnus improves teaching, research and community service

BY PATRICK McDONAGH

"Many industrial practices are not sustainable over the long term," says Lorne Trottier, "so we need to upgrade them." And when the co-founder of Matrox, a successful maker of computer graphics and imaging hardware, believes in something, he makes it happen.

A McGill Governor Emeritus, Trottier has contributed generously to his alma mater through the years to support new research chairs, graduate fellowships and the construction of the state-of-the-art Lorne M. Trottier Building, home to the Department of Electrical and Computer Engineering and the School of Computer Science.

His latest \$20-million gift will fund a series of initiatives at our Faculty and at the Faculty of Science that will enhance and promote sustainable scientific and technological development. The cornerstones of the gift are the Faculty of Engineering's Trottier Institute for Sustainability in Engineering and Design (see adjoining article), and the Faculty of

Science's Trottier Institute for Science and Public Policy.

The latter initiative will provide leadership in advancing science-driven policy and enhance scientific literacy among the general public. Trottier's Science Faculty gift includes fellowships, undergraduate research awards, support for public fora, publications and outreach initiatives such as the McGill Office for

"I believe that universities such as McGill have a crucial role to play not only in educating the next generation of scientists and engineers, but as centres of enlightenment for the broader society."

Science and Society, the Lorne Trottier Public Science Symposium and the Mini-Science series. The institute will serve as a hub for scientific debate, training and advocacy.

As regards the Engineering Faculty

institute, Interim Dean Andrew G. Kirk says "our Faculty has been privileged to work in concert with researchers and units across McGill for many years to develop principles of sustainability in engineering

▶ (see *An exceptionally committed alumnus* page 6)



High-tech entrepreneur and alumnus Lorne Trottier is co-founder of the video graphics company Matrox, which he nurtured from a shoestring operation based in his apartment to its present status as an industry leader.

OWEN EGAN

Steady growth in two important areas of Faculty life

BY PATRICK McDONAGH

The number of professors and students at the Faculty of Engineering continues to grow. Total graduate and undergraduate enrolment is up approximately 35 per cent since 2005—from 3,200 to 4,330—and the number of professors has increased 19 per cent during the same period—from 128 to 152.

Four recent Faculty hires are J. Matt Kinsella, from the University of California, Mustafa Kumral, from Inonu University (Turkey), Yaoyao Fiona Zhao, from École Centrale de Nantes (France), and Michael Kokkolaras, from the University of Michigan. The following are short descriptions of their research specializations.

- Bioengineering Professor **J. Matt Kinsella**, a graduate of St. Xavier and Purdue universities, creates nanoparticles for a range of medical applications, from helping to target drug delivery to specific cells in the body to

providing a contrast agent used in aid-imaging technologies. He also explores ways of using the interface between cells and engineered materials to prompt stem cells to grow in particular patterns or towards specific cell types.

- Mining Engineering Professor **Mustafa Kumral**, a graduate of Hacettepe, Cukurova and Leeds universities, has developed mathematical algorithms to assess the risks associated with a particular mining project. His research fills a gap between mining engineering and mineral economics, integrating business and technical concerns to give a broad profile of the factors that will determine the likelihood of a mine's success or failure.

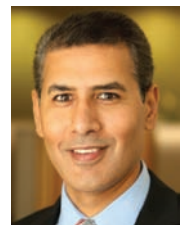
- Mechanical Engineering Professor **Yaoyao Fiona Zhao**, a graduate of the Beijing Institute of Technology and the University of Auckland, works in manufacturing informatics, developing models of the design process in order to find ways of streamlining the divergent flow of digital data between contractors

and suppliers, and across hardware and software programs. Her research also involves enhanced product sustainability, focusing especially on energy consumption, material efficiency, and potential for recovery and recycling in other applications.

- When individual components come together in a complex engineering system, such as an aircraft, they must be integrated well to manufacture the best possible product. Mechanical Engineering Professor **Michael Kokkolaras**, a graduate of the Technical University of Munich and Rice University, is contributing to this process by developing algorithms that help to ensure the optimal design of complex and multidisciplinary engineering projects. His future research plans include optimizing the design of complex "systems of systems," for example, multi-faceted energy networks that integrate different energy sources to satisfy varying demands across time and geography.

Recent appointments

Civil Engineering and Applied Mechanics Professor **Mohamed Meguid** has been named Associate Dean (Undergraduate Education), succeeding Professor Subhasis Ghoshal, who is returning to teaching and research after six years as an associate dean.



Mohamed Meguid

A graduate of Cairo-Azhar University and the University of Western Ontario, Professor Meguid's specialization is geotechnical engineering. Prior to his appointment he was Associate Chair of the Department of Civil Engineering and Applied Mechanics. He joined McGill in 2004.

Chemical Engineering Professor **Sylvain Coulombe** has been named his department's new chair, succeeding Professor Dimitrios Berk, who served eight years in the post.

A graduate of Université de Sherbrooke and McGill, Professor Coulombe worked as a Senior Research Scientist at General Electric Global Research & Development (USA) before joining McGill in 2001. He is a registered engineer and winner of the 2010 Carrie M. Derick Award for Excellence in Graduate Teaching and Supervision.



Women comprise 23 per cent of the students at our Faculty. A student group called **POWE** (Promoting Opportunities for Women in Engineering) joined forces recently with Faculty career counsellors to hold the third annual Women in Engineering Speed-Networking event. Twenty professional women were on hand to help students explore career paths and discuss transitioning from the classroom to the workplace. Pictured above are (photo 1) Racha Assaf, BEng'09, (Shell); Lindsay Ferguson, BEng'11, (SNC-Lavalin); Ashley Galagusz, Elizabeth Perron and Vanessa Vannelli (POWE); and (photo 2) Sonia Kouassi (Bombardier Transportation).

► *The Alma Mater Fund (cont'd from page 2)*

alumni gifts when he was a student—
“at least not in terms of obtaining an internship or a scholarship or anything like that—but I’m sure the equipment and the facilities we used back in the 80’s were partly paid for by earlier generations of alumni.

“When I donate now, I do so with that thought in mind. I see my contributions as helping current and future students who, in turn, will do their part one day to help the generation that comes after them.”

If he has one message for his fellow grads, Bergeron says it would be that “it’s

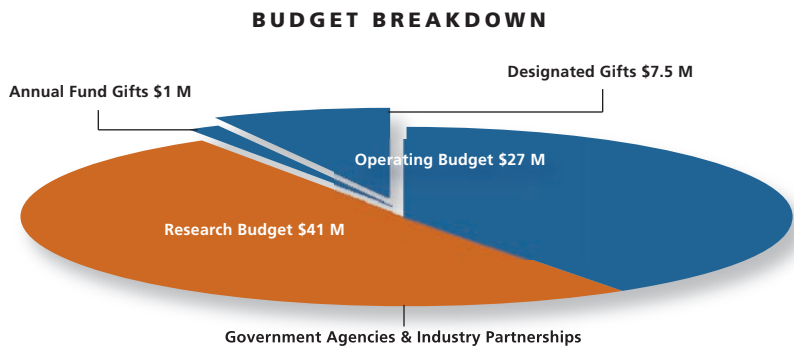
not so much the amount you give but the giving itself. Fifty or a hundred dollars is not an awful lot for one individual to donate each year, but if you can convince 10,000 of our grads to donate, that would mean an incredible resource for McGill Engineering.”

Small gifts add up

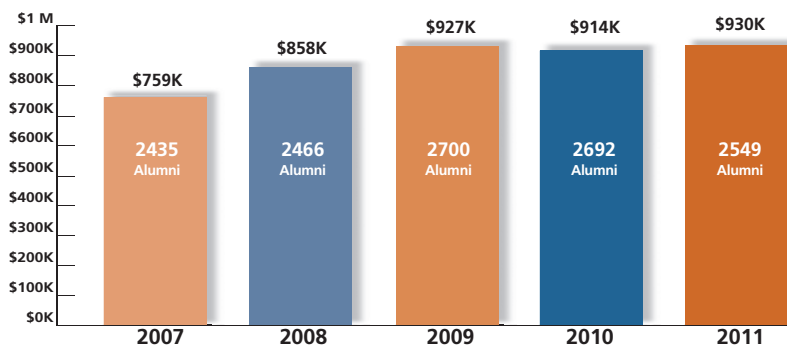
Many alumni think that big gifts are the only way to make a real difference at McGill Engineering. Individuals of more modest means sometime feel that the gifts they are able to give are unimportant. Nothing could be further from the truth.

All donations have a ripple effect, and when alumni give every year—regardless of the amount—they make a huge difference. When students and professors tell you that every gift counts, they truly mean it, and they appreciate each and every one.

As the table at right indicates, 11 per cent of the Faculty of Engineering’s 22,100 alumni made an annual gift donation last year.



ANNUAL FUND GIFTS FROM 2007 – 2011



► *An exceptionally committed alumnus (cont'd from page 4)*

and design, but the new Trottier Institute will add multiple dimensions to that valuable work. It will provide tremendous impetus to professors and students who want to play a meaningful role in influencing public policy.”

“We often read about the views of different pressure groups—environmental groups, industry groups, politicians—concerning sustainability issues, but these are not objective sources of information,” Trottier adds.

“I anticipate that the new sustainability

institute will conduct research and publish authoritative articles that bring the latest global scientific and technological knowledge to controversial issues.”

In accepting the Trottier family’s gift Principal Heather Munroe-Blum lauded Trottier for being one of McGill’s most generous and forward-thinking benefactors.

“His exceptional contributions demonstrate the extraordinary things that can happen when McGill ingenuity, a visionary alumnus and philanthropic

investment come together to spearhead research and innovation in fields that are shaping the future—of Quebec and Canada and internationally.”

Trottier, a member of the Order of Canada, was awarded an honorary McGill Doctor of Science degree in 2006. Both his government and McGill honours recognize his outstanding commitment to advancing knowledge, discovery and public policy related to science and engineering, and the importance of bringing science to the public.

McGill Engineering’s Alma Mater Fund goal is \$1-million. Thank you for your past and future support.



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