



skulematters

UNIVERSITY OF TORONTO APPLIED SCIENCE & ENGINEERING



THE NEXT GENERATION

Skule Alumni Share Their Start-up Experiences

PLUS
YOUNG GRADS WIN GOVERNOR GENERAL'S MEDALS

CELEBRATING 175 YEARS OF GREAT MINDS



insideskule



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On the Cover:
l.-r.: Paul Chen,
Emmy Choi and
Tony Lacavera
in the new
Bahen Centre
for Information
Technology.



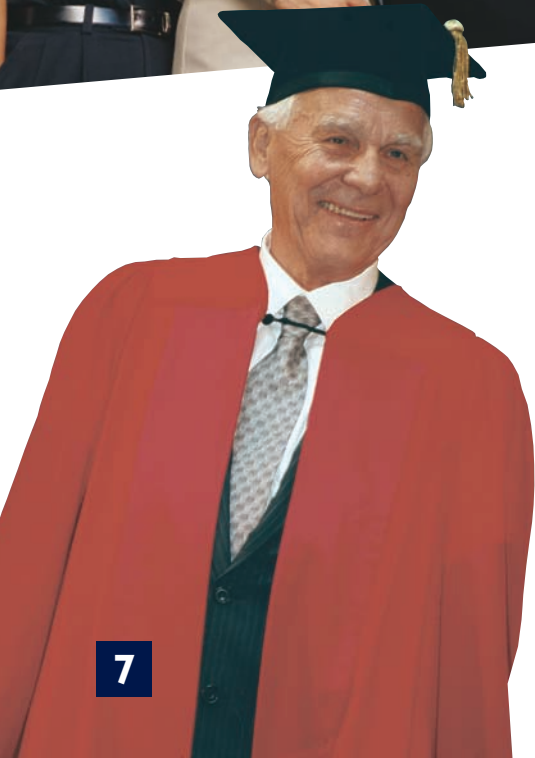
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students, and friends of the
Faculty of Applied Science
and Engineering*

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We invite inquiries concerning active participation in Faculty programs, comments and suggestions from readers.
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A New Environment for Innovation

There is excitement in the air this fall as classes resume and our faculty members rededicate themselves to providing a leading edge engineering education. Our student body has grown in size and calibre; our researchers are making advances and headlines. A focal point for the excitement is the opening of the Bahen Centre for Information Technology, the Faculty's first new building in more than a decade. I invite you to visit this impressive new facility when it officially opens in October.

This new state of the art building will foster a climate for innovation. It will enhance our capacity to educate future business and technology leaders and showcase the inventiveness of interdisciplinary engineering education and its potential in the creation of commercially viable ideas. The Bahen Centre will house students and researchers in The Edward S. Rogers Sr. Department of Electrical and Computer Engineering, the Division of Engineering Science and the Department of Mechanical and Industrial Engineering, as well as the Department of Computer Science, offering opportunities for collaboration and easing the space pressures resulting from increasing enrolment. Our Professional Experience Year program will also call the new building home.

The Bahen Centre will house Canada's only dual engineering/management degree program. The innovative Jeffrey Skoll BASc/MBA program, named in honour of the 1987 graduate who co-founded eBay, combines an

undergraduate engineering degree, an MBA, a professional experience year and a management work placement, in just under seven years. Graduates will have the skills to take their ideas to market and maximize the opportunities offered by emerging technology.

The Centre for Microelectronics Assembly and Packaging (CMAP), the only one of its kind in Canada, Bell University Research Laboratories, the Centre for Advanced Coating Technologies, the Motorola Networking/Multimedia Laboratory, the Nortel Institute for Telecommunications and the Rogers AT&T Wireless Communications Laboratories are but a few of the teaching and research facilities located in the eight-storey facility,

offering potential for the development of future commercial applications.

Our graduates have long been known as innovators. The historic honour roll (see page 20) includes the inventor of the first battery-less radio receiver and founder of CFRB radio, Edward S. Rogers Sr., who studied here, and Lew Urry, who developed the Energizer battery, displayed in the Smithsonian in the same room as Edison's lightbulb. A few of our young and aspiring innovators are profiled on page 12.

Some of the country's most widely recognized companies, including ATI Technologies, Barrick Gold Corp., Celestica Inc., Clarnet Communications Inc., eBay Inc., IMAX Corp and Sciex, were built by our alumni. Sciex is an outstanding example of a successful spin-off company based on research conducted here. The company originated

"Graduates of the Faculty have long been known as innovators."



Dean Anastasios Venetsanopoulos

when then Professor Barry French saw the potential of the mass spectrometer he and colleagues at UofT's Institute for Aerospace Studies (UTIAS) had developed for the Viking space probe. Later purchased by MDS, the company is now Canada's largest supplier of analytical instrumentation selling its products worldwide, through a partnership with Perkin-Elmer. Another example is ElectroPhotonics Corp., co-founded by fibre optics engineer Tino Alavie, a post-doctoral research fellow at UTIAS. The company, renamed E-Tek ElectroPhotonics Solutions Corp, when it was purchased by a California-based company, made a name for itself with new fibre-optic sensor technology that enabled the creation of 'smart bridges', including the P.E.I. Confederation Bridge. The technology enhances safety by detecting and 'reporting on' structural changes and stresses.

Our graduates are investigating alternative energy sources, addressing key medical issues, and creating a safer and healthier society. They are contributing to the Canadian economy in manufacturing, biotechnology, communications, law, finance, medicine and the resource industries.

I congratulate all our alumni for their achievements, whatever direction their career has taken. The outstanding problem-solving skills they developed as UofT Engineers are making a difference to business, industry and society.

The Double Cohort Is Coming!

Professor Will Cluett
Vice-Dean (Undergraduate)
and Chair, First Year



This coming year, the last Ontario high school students from the OAC (Grade 13) curriculum and the first from the new Grade 12 curriculum will be applying to enter university. This 'double cohort' of students will result in an increase in the number of applications at universities across the province. Ontario students and their parents may be wondering what Engineering @ UofT is doing in response, while students from outside Ontario may be wondering if there will still be a place for them.

Our intake of students into First Year has been steadily growing over the past several years. While our First Year class size was about 650 students in 1994, our target intake for 2003 is 1,075 students, a 65% increase. At present, we now have spots for almost 600 students in Electrical and Computer Engineering and

Engineering Science alone, and we still have six other outstanding Engineering programs from which to choose.

Our plan for 2003 consists of increasing our class sizes in Chemical, Civil and Materials Engineering, while providing 100 additional places across all nine programs for Ontario high school students as compared to the number of Ontario high school students we expect to have enrolled in Fall 2002. At the same time, we plan on maintaining the same number of places for students from outside of Ontario.

The increases we have made in our First Year class size since 1994, together with our plan for 2003 will help us meet our goal of making additional room for students affected by the 'double cohort', while still attracting top students from right across Canada into all nine of our engineering programs.

from the **research & graduate studies office**

An International Perspective

Professor Javad Mostaghimi
Vice-Dean, Research
& Graduate Studies



The Office of the Vice-Dean has recently relocated to the eighth floor of the new Bahen Centre for Information Technology. Not only can I see all the other engineering buildings – it is a truly exceptional view – but I am surrounded by classrooms, laboratories and fellow researchers in the high-tech research environment of this beautiful new building. This setting and the panorama before me keep me mindful of the benefits of taking a global, interdisciplinary, and collaborative approach to research.

The University of Toronto and this Faculty aspire to be ranked among the leading research-intensive institutions in the world. With this goal in view, the Faculty is establishing meaningful international relationships with like institutions to facilitate collaborative research initiatives and student exchanges, and to

enhance our presence on the world stage.

Forming strategic international partnerships will have many benefits including:

- Improving our ability to contribute to global debates and problem-solving through key partnerships;
- Creating opportunities for faculty and students to experience new research and learning environments through participation in international initiatives;
- Increasing international awareness of the superior work of Faculty researchers – potentially increasing recognition through major awards and international prizes;
- Increasing our research capacity and participation in first-rate international academic networks;
- Drawing more top-quality graduate students and faculty to the University of Toronto through heightened awareness of the Faculty's research enterprise.

Establishing new strategic partnerships is an important step in achieving our aspirations.

Work Terms in Japan an Enriching Experience

Lisa Simpson
Director



This year, nine adventurous engineering students are headed to Japan to complete their PEY work terms, combining a vocational experience with learning about a new culture.

Seven of these students won placements through the Co-op Japan Program, an initiative established to increase bi-lateral relations between Japan and Canada, run through the University of Victoria. An exceptionally strong group of candidates, the largest group accepted by the program from UofT, competed for the opportunity with students at universities across Canada. Those selected attended a month-long intensive Japanese language and culture program in Vancouver prior to departure. Participating this year are: Patricia Lai (third year Chemical Engineering – placed at Asahi Glass Co. Ltd); Evelyn Ng (third year Materials

Science Engineering – Sumitomo Chemical); Vincent Kwan (third year Computer Engineering – Yamatake Corporation); Chad Lyew (third year Electrical Engineering – Bosch Automotive); Keith Davies (third year Engineering Science – Sansyu Finetool); Sean Buckley (third year Engineering Science – Yokohama Rubber); and Frances Leung (third year Mechanical Engineering – ATR Information Science Laboratories).

In addition, two students are going to Japan via the traditional PEY route. Third year Engineering Science students Randy Chiang and Adrian Cheng will be working at the Kagoshima and Beppu Software Development Labs of Seiko-Epson in Kyushu, Japan. This is the first time U of T students have gone to work at Epson facilities in Japan. We hope the success of these students leads to greater numbers of UofT students enjoying the enrichment and opportunity of placements abroad. For more information, please contact the PEY office at 416-978-3132 or e-mail us at pey@ecf.utoronto.ca

planned giving

Will Power

Malcolm McGrath
Planned Giving Officer



IT is not often that a person or group will tell you to “Remember us last”, but that is exactly the message I give in Planned Giving work.

Once you have provided for your loved ones, the creation of a planned future gift can give you a very deep sense of personal satisfaction, extend crucial support to students, facilities, or research, and even make financial sense.

Here are a few ways to do it:

Bequest – you can select a set amount or a percentage of your estate to benefit a general or a specific purpose, and to make a resounding statement about those values and priorities that have shaped your entire life.

Charitable Remainder Trust – You can establish a trust with cash or income-producing investments, keep the net trust income

for your lifetime, designate the original trust principal to UofT, and receive a substantial charitable tax credit today.

Residual Interest Agreement – You can transfer ownership of your house, condominium, or cottage to UofT, continue to enjoy private use of your property for life, and receive a substantial charitable tax credit today.

Charitable Life Insurance – You can transfer ownership of an existing policy to UofT so that the cash surrender value and any future premium payments qualify for a full charitable tax credit.

The Engineering Gift Planning Office is here to help you with these or other ideas. For further information, please call me at 416-518-7177 or Joel Porter at 416-978-3811.

Why not make the gift of a lifetime?

The Community We Call Skule™

Ashley Morton
President, Engineering Society
2002-03



The University of Toronto Engineering Society holds the distinction of being the longest running formal engineering association in Canada. Although a great deal has changed since its start in 1884, one thing has remained constant: the bond that joins members of the UofT Engineering community.

Before I came to this Faculty, I was never a flag-waver, or someone who bothered to learn school cheers. But after only a year here, I made a point of proudly wearing a University of Toronto Engineering jacket and becoming involved. I am proud to be identified as a member of this community. All of us, alumni and current students, know what it feels like to see people in hardhats, walk through “our” buildings on campus, and be part of traditions that span over 100 years.

Current student activities, including the teams to which so many volunteer hours are devoted, signify our commitment. Now, instead of running Shinerama, we’re collecting water bottles for the homeless. Earlier this summer, in honour of Gay Pride Week, the Brute Force Committee painted the SAC dome in rainbow colours. We’re making presentations to the Governing Council, arguing for dedicated activity space. Instead of allow-

ing alcohol to be the focus of many events, we’re creating policies to address the fact that half of our first year class is underage.

The Engineering Society of 2002-2003 will have almost 4,000 members, a cash flow of over \$1 million and will enjoy the fruits of nearly half a million person-hours of participation and labour.

And thanks to the generations before us, we have inherited something that really matters – a solid foundation of past commitment and achievement that we can build on.

Ashley Morton, President, Engineering Society 2002-03, president@skule.ca, 416-978-1244.

UPCOMING EVENTS 2002-2003

For High School Students

For more information, follow the links for prospective students on our Web site.

U of T Discovery Day
Saturday, October 5

**Engineering Saturdays
Lecture Series**
October to April

**Campus and
Engineering Tours**
Thursdays and Fridays
in October, November,
February and March

F!rosh for a Day
November 2

**Program
Information Sessions**
October and November in
Vancouver, Calgary, Edmonton,
Winnipeg, Montreal, Ottawa,
Hamilton, St. Catharines,
Kitchener and London

**March Break
Open House**
Saturday, March 8, and
Monday, March 10, 2003

**Leonardo da Vinci
Competition**
Written in High Schools
across Canada on Thursday,
April 24, 2003

For Alumni

Homecoming
Saturday, October 5
Noon to 1 p.m.
Parade on St. George Street
6 p.m. Hart House – Dinner &
Entertainment \$50/ticket

Awards Banquet
Thursday, October 24
6 p.m. Toronto Hilton
\$100/ticket

Skule Society
Thursday, November 14
6 p.m. Crowne Plaza
by invitation to Annual Fund
donors, \$1,500+

Skule Nite
Wednesday, March 12, 2003
5 p.m. Reception
8 p.m. Show \$30/ticket

Spring Reunion
Friday May 30, 2003
6 p.m. \$95/ticket

Alumni SUDS
(Engineering Pub)
Friday, October 4
Friday, January 17
Friday, April 4
opens 3 p.m.

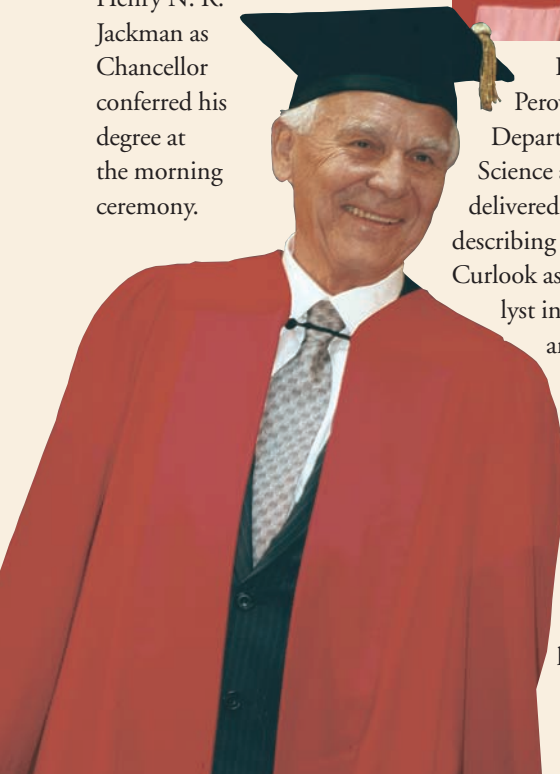
For more information on alumni events, call 416-978-4941.

Visit the Faculty’s newly redesigned Web site: www.engineering.utoronto.ca

Convocation 2002 a Memorable Occasion

IT would not be surprising if the graduates of the class of 2002 think of their June 21 Convocation as truly special. The growth of the Faculty meant that this was the first time that two separate convocation ceremonies took place on the same day. The class was addressed by two exceptional and inspiring honorary degree recipients. Dr. Walter Curlook, former Vice Chairman and Director of Inco Ltd., and a triple graduate of the Faculty spoke in the morning; Ted Rogers, the President and CEO of Rogers Communication Inc., was honoured in the afternoon. And, a 99-year-old alumnus, Clarence Osborne, fulfilled a long-held wish to convocate when the Honourable

Henry N. R. Jackman as Chancellor conferred his degree at the morning ceremony.



Professor Doug Perovic, Chair of the Department of Materials Science and Engineering, delivered a heart-felt citation describing Professor Walter Curlook as a visionary and catalyst in the fields of mining and metallurgy, education and northern development. Dr. Curlook's innovations have made mining safer and more productive. Among a great many other achievements, he helped to found

Top: Graduand Clarence Osborne and Dean Tas Venetsanopoulos. Honorary degree recipients Edward S. (Ted) Rogers (centre) and Walter Curlook (bottom)

Science North and fostered the creation of the Centres of Excellence for Chemical Process Metallurgy at UofT.

Edward S. (Ted) Rogers has achieved distinction for his significant contribution to the communications industry and his commitment to

technological innovation. Rogers, who received an honorary Doctor of Laws degree, has also made his mark as a philanthropist. He has been a strong supporter of education and particularly generous to this Faculty. In his remarks, Rogers encouraged the graduating class to build their careers in Canada, following the example set by his father, who invented the first batteryless radio receiver.

The fact that receiving his degree in chemical engineering at long last meant so much to Clarence Osborne, moved all who attended. The Hamilton resident, who will be 100 years old in December, had stated that it had been his "one regret in life" that circumstances prevented him from attending his 1933 graduation. As Osborne's proud 91-year-old wife and other family members looked on, the venerable hall was filled with the applause of the visibly moved graduands.

Welcoming New Faculty Members

Dean Anastasios Venetsanopoulos extends a warm welcome to our new faculty members: I. Kaysi, C. Christopoulos (Civil Engineering); R. Genov, B. Liang, H.K. Lo, L. Pavel, G. Steffan, S. Voinigescu, W. Yu (Electrical and Computer Engineering); G. Jamieson, R. Kwon (Mechanical and Industrial Engineering); W. Chan (Institute of Biomaterials and Biomedical Engineering); P. Grant, J. Martins (Institute for Aerospace Studies). We are confident that our Faculty will be enriched by their contributions.

Espee Ess Races for Skule

Meet Espee Ess, the newest member of UofT's Engineering community. Named after the School of Practical Science, as the Faculty used to be called, the owners of the three-year-old thoroughbred colt, Sydney Cooper (BASc Civil 4T5) and his son Richard (BASc Civil 7T3), have pledged 5% of the colt's earnings back to Skule.

"He ran for the first time in October last year, and ran a very credible race, despite being pushed badly as he left the gate," said Cooper Sr. "He finished fourth in that race and then ran again in December, against a large field, and placed third." These races netted the Faculty approximately \$500,



Alumnus Sydney Cooper poses with Espee Ess and the horse's morning exercise rider.

designated to support student organized events and teams.

While Espee Ess finished

out of the money in his first two races in 2002, Cooper is confident that his colt will rally.

"He's the son of Boundary, a winning U.S. sire," explains Cooper, who has had good fortune with his other horses, including Bright Adam, who placed second at the Queen's Plate two years ago. "We're hoping for a better performance for the rest of the racing season, which will result in much fun and dollars for all." The Faculty is honoured that the Coopers have named this horse after their alma mater, especially considering that all the other horses they have owned over the years have been named after family. So, if you ever happen to be at Woodbine Racetrack in Toronto, why not look out for Espee Ess and let out a cheer for Skule™?

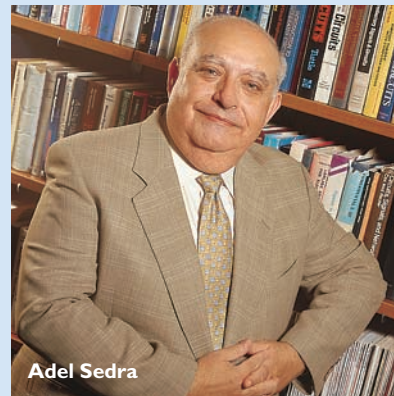
Admired Provost Sedra Returns to the Faculty

After nine fruitful years as UofT's respected Vice-President and Provost, Professor Adel Sedra is enjoying his new office in the Bahen Centre for Information Technology and his return to the Faculty. The culmination of Professor Sedra's tenure and his return to The Edward S. Rogers Sr. Department of Electrical and Computer Engineering last July 1 was marked by appreciation of his profound legacy.

One of Sedra's many accomplishments is the university's now well-established culture of academic planning linked to budgeting. The process, which

became the foundation for UofT's ambitious fundraising efforts, was a first in North America and set the standard for the university sector. "Adel has effectively led an inclusive academic planning exercise that identified the priorities necessary for UofT to realize its ambitions," said Jon Dellandrea, Vice-President and Chief Advancement Officer. "In this role, he was an absolutely critical partner in helping generate the resources the university needs to move forward."

Professor Sedra is keeping the pace he's maintained for the last nine years, preparing for teaching and research and



Adel Sedra

revising *Microelectronic Circuits*, the 1,200-page text he co-authored with his long-ago thesis supervisor, Kenneth Smith. This will be the fifth edition of the respected text, which has been translated into ten languages and produced sales in excess of 750,000 copies.

An anonymous donor has dedicated a lecture hall in the Bahen Centre in Professor

Sedra's name. As well, his Electrical and Computer Engineering colleagues are honouring the former Provost with the creation of The Adel S. Sedra Outstanding Student Awards, which will exist in perpetuity. The awards will be given to the top three students

in each of the Department's two undergraduate programs, electrical engineering and computing engineering.

"We are enormously proud of Professor Sedra's exceptional contributions to education over the past three decades," said ECE Chair Safwat Zaky. "We are thrilled to have him back home in our Department."

Spotlight on Student Success

A number of outstanding students have recently been winning kudos, in their respective fields of endeavour.

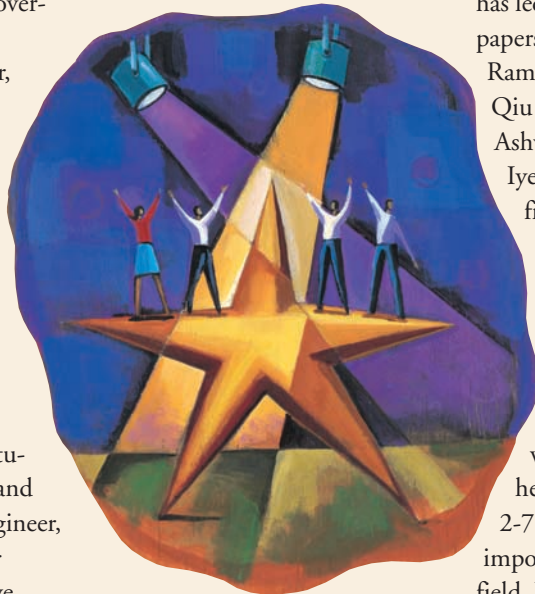
The Faculty's Formula SAE team, which designs, builds and races a formula-style racecar, placed second overall at an international competition in Leicester, England this July.

Competing against 44 teams of university students, the team won five additional awards for everything from speed to endurance to power train design.

Elena Andreeva, an electrical engineering student, now in her PEY, and a fourth-generation engineer, won a special award for most creative/innovative business plan in an international Enterprise Creation Competition sponsored by NASDAQ and Ernst & Young last semester. Working with Professor Joseph C. Paradi, Executive Director of The Centre for Management of Technology and Entrepreneurship (CMTE), Andreeva wrote a business plan for an integrated passenger safety system designed to prevent collisions by detecting signs of driver fatigue or intoxication. The multi-talented student donated her \$500 USD prize to the Faculty to assist students who participate in similar competitions in the future.

If fourth year computer engineering student Alvin Mok has his way, physicians will soon

have a new medical imaging device based on optical coherence tomography (OCT) that could be invaluable in performing biopsies and related operations. Mok's achievements in working with computers and optical engineering were



recently recognized when he was awarded the 2002 D.J. Lovell scholarship by the International Society for Optical Engineering at its 47th Annual Meeting in Seattle, Washington on July 10. Mok, who will write a fourth year thesis under ECE Professor Deepa Kundur, already has two patents and three publications for work

he is completing, a strong interest in biomedical imaging systems and advanced image processing algorithms and a hefty list of research and volunteer experiences.

Working with ECE Professor George Eleftheriades has led to award-winning papers for PhD students Ramesh Abhari and Meide Qiu and MASc student Ashwin Iyer. Abhari and Iyer were chosen from a field of 241 submissions as second and third prize-winners respectively, in the student paper competition at the 2002 IEEE International Microwave Symposium, held in Seattle from June 2-7, the largest and most important symposium in the field. It is unusual for a single group to be honoured with two out of the three winning spots in this competition. PhD student Meide Qiu took second prize honours at the 2002 IEEE International Symposium on Antennas and Propagation, the most important symposium in the field of antennas, held in San Antonio, Texas, June 16-21.

Student Wins SNC Award

Following a competition involving three Ontario universities, fourth year mechanical engineering student, Patrick Sikka was selected as the recipient of the SNC-Lavalin Award, consisting of a four-month internship at the company and a scholarship for \$1,500. Sikka's success was feted at a lunch hosted by President of SNC-Lavalin Engineers & Constructors Inc. Roger Nicol, the company's VP, General Engineering, Michel Weiss and its VP, Human Resources John Penny. Says Jacques Lamarre, President and CEO of SNC-Lavalin Group, "We created the award to help prepare young engineers for the future by presenting them with the challenge of using solid theoretical knowledge and defined practical solutions in real situations."

ILLUSTRATION: DAVID MOORE

Solar Car Setback

The Faculty's Blue Sky Solar Car team faced a significant setback this August, after its vehicle, named Faust, was struck by a car near Belleville, ON. The team was driving the car across Ontario and Quebec

in a promotional tour called "Drive the Future", which set out to demonstrate the viability of solar power as a clean alternative to fossil fuels and alternative energy transportation. "We're devastated about the heavy damage," says Jessica

van Vliet, manager of the team, "but we're thankful that no one was seriously injured." The team, which placed 14th in the 2001 World Solar Challenge in Australia, intends to rebuild the car and race again in the future.

Ford Canada and Stuart Energy Showcase the Future

On June 19th, faculty and students gathered to view a next-generation hydrogen fuel cell electric vehicle and the hydrogen infrastructure required to support it.

The Ford Focus fuel cell vehicle uses hydrogen fuel to produce electricity, instead of a battery, explained Phil Chizek, an engineer with Ford's Think Division. "The fuel cell utilizes a catalyst to perform a chemical process that combines oxygen from the air with hydrogen fuel to produce electricity and water. The hydrogen gas is safely stored on the vehicle in a pressurized tank and is supplied to the fuel cell at less pressure than gasoline to a fuel-injected engine."

Jon Slangerup, President and CEO of Stuart Energy, remarked that the vehicle's launch marked a great day for Canada. The car features

groundbreaking fuel cell technology developed by Ballard Power Systems of B.C. The CFP-450 portable fueling station showcases the innovative lightweight fuel storage system developed by Dynetek Industries of Alberta, and an

electrolyzer developed by Stuart Energy of Ontario and Quebec.

Stuart Energy co-founder and Chairman, Sandy Stuart (BASc Chemical 4T7), was proud that this project had come full circle. "My father, with whom I co-founded the company, studied at UofT in 1905," he said. "As early as then, he predicted that hydrogen would be the wave of the future."

The rich tradition of UofT expertise at Stuart Energy continues into the future with Sandy's son Andrew (MAsc Chem 1987), serving as Vice-Chair of the company. Professor Steven Thorpe, of the Department of Materials Science and Engineering is the company's former Vice-President of Technology.

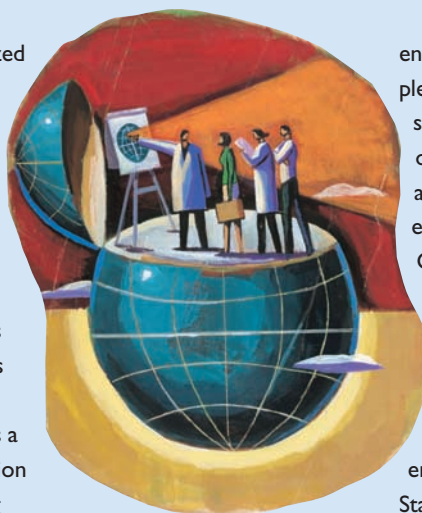


I-r: Norm Stewart, VP Government Relations, Ford; Sandy Stuart, Chairman and Jon Slangerup, President and CEO, Stuart Energy

Faculty Hosts North American Conference of Environmental Professors

A conference organized by the Faculty's Division of Environmental Engineering, together with professors in Civil and Chemical Engineering, drew nearly 200 environmental engineering professors, graduate students and practitioners from across North America. Held every three years, the conference is a joint meeting of the Association of Environmental Engineering and Science Professors and the American Academy of Environmental Engineers.

Chaired by Professor Phil Byer, Chair of the Division of



Environmental Engineering, the August 10-14 conference included workshops on computer-based learning tools, industrial ecology and

environmental ethics and plenary sessions on understanding complex systems, use of new technologies, sustainable systems and innovative educational approaches. George Crawford (Civ 7T6), Vice-President of CH2M HILL Canada, was one of the key supporters of the conference.

World-renowned speakers included professors from Stanford, Berkeley and the University of Iowa, as well as UofT Civil Engineering Professor Bryan Karney. Winner of this year's Faculty Award for Teaching, Karney

delivered a dynamic and provocative talk on education. Our Faculty was well represented among papers accepted for oral presentation by Professors Greg Evans (Chemical) on his research on the characterization of air pollutants, Chris Kennedy (Civil) on sustainable urban infrastructure and Willem Vanderburg (Mechanical and Industrial) on the adequacy of the current education of engineers.

Environment Canada Senior Climatologist David Phillips spoke on the weather and Dr. Andrew Benedek, Chairman and CEO of ZENON Environmental Inc., shared his valuable and successful experiences of moving from research to the business world.

Spring Celebrations Pay Tribute to Skule Supporters

The Faculty celebrated new endowed chairs and research laboratories this spring, established through the vision and generosity of alumni and friends.

John Patrick Sheridan, a mining “guru”, veteran geophysicist, engineer and mining promoter, created the John Patrick Sheridan Chair in Minerals Processing. Professor V.G. Papangelakis is the inaugural chairholder. Gerald Heffernan, a true technological visionary whose innovations have reshaped the global steel industry, established the Gerald R. Heffernan Chair in Materials Processing, which will be held by Professor T.A. Utigard. The two chairs will work synergistically, as co-Directors of the Faculty’s Centre for Minerals and Materials Processing, providing it with permanent leadership. Both were feted at a May 28 event at the Faculty.

Heffernan and Sheridan have strong links to Skule. Both are alumni and both have previously established scholarships here. Heffernan is also a member of the Department of Materials Science and Engineering Advisory Board. Reminiscing



Gerald Heffernan and Prof. T.A. Utigard



Marjorie Sheridan and Prof. V.G. Papangelakis

about his time at the Faculty, Heffernan recalled learning that an engineer is by nature an economist from C.H. Mitchell, who was Dean at the time. He also cited the great teaching in process metallurgy of former Chair of Metallurgy and Materials Science, Prof. George Guess, saying that Guess’

lessons served him well in later years. Marjorie Sheridan, wife of Patrick, commented how proud she and her family were to give back to the University. Her 40-year involvement in the Women’s Association of the Mining Industry of Canada and role as one of its past Presidents was also acknowledged.

On June 26, the Faculty celebrated the establishment of the Rogers AT&T Wireless Laboratories. “It is a reflection, in part, of the University’s excellence in areas related to wireless technologies,” said Safwat Zaky, Chair of The Edward. S. Rogers Sr. Department of Electrical and Computer Engineering.

Professors Frank Kschischang and Glenn Gulak will use the labs to conduct research in algorithms, computational procedures that provide a ‘recipe’ for processing signals. Professor George Eleftheriades will also use the Rogers AT&T Laboratories for research in the areas of wave electronics, steerable antennas, and using man-made materials with superior properties tailored to enhance wireless communications.

President and CEO of Rogers AT&T Wireless, Nadir Mohamed, expressed the company’s delight in being part of this exciting venture. He spoke of how the facility will help to meet a societal need, through the training of future generations of leaders in electrical and computer engineering. He also noted how excited the company is to be part of this pioneering research and the advancement of knowledge in this discipline.



l-r: Dean Tas Venetsanopoulos, President Robert Birgeneau, Rogers AT&T Wireless President and CEO Nadir Mohamed, VP Jon Dellandrea and ECE Chair Safwat Zaky

THE NEXT **G E N E**

SKULE ALUMNI SHARE THEIR START-UP EXPERIENCES • BY CHRISTINE SZUSTACZEK

“I’m living my **dream** job,”

says Andrew Sit (BASc EngSci 9T6), CEO of VirtualThere, a multi-million dollar Instant Messaging (IM) company, whose sales have grown tenfold over the past year. Sit, together with Suk Ho Emmy Choi (BASc Elec 9T5), founded the company in 2000 because they were passionate about the technology and they knew there was a market for enterprise IM.

Unlike e-mail, which is delivered to and retrieved from a person’s inbox, instant messages are delivered in real time to people who are logged onto their instant messaging applications. While public IM systems created by Yahoo, AOL and Microsoft can be downloaded from the Internet for free, these mostly cater to consumer audiences, note Sit and Choi, whose company has created an IM product line tailored to the specific needs of corporate users.

“Integrating the best of both PC-based instant messaging and mobile messaging, our product is designed to help companies benefit from real-time business communication,” says Sit. A key element is presence detection – the ability to see whether someone else is logged in and available for communication. The IM platform automatically routes messages to a user’s active device, whether that be a PC,

cellphone or other wireless handheld device. “Our product helps to reduce phone tag, since each user knows who is available at any given point. As a result, users get the answers they need right away, saving them time and improving workflow.” Added features designed for enterprise clients include security and privacy measures, message archiving and auditing, multilingual support, collaborative tools, and the ability to integrate with existing information systems.

“Early industry recognition from Internet World, Nokia and IBM gave us more confidence in our own abilities and confirmed our vision,” confides Choi. “First you need to establish your reputation, then your revenues flow from there.”

“What has gotten us this far has been the dedication and skill of all the members of our team,” adds Sit. “We’re synchronized and share the same passion, which helps us to reach our goals.” That team consists of an eleven-person company, with eight UofT engineers at its core.

“We all quit nice paying jobs to do this and it wasn’t easy,” points out Choi. “After graduating, we went our different ways, but we all kept an interest in using, developing and applying technology.

R A T I O N



KODAK E100VS

50

VIRTUALHERE

Skule alumni at the core of the company include:
Back row l.-r.: Andrew Sit, Bernard Chan, Raymond Tsui, David Leung and Karen Chan. Front row l.-r.: Emmy Choi and Franciscus Partaatmadja. Not pictured: Yi Jen.



CANOPCO INC.

Skule alumni at the core of the company include:
 Back row l.-r.: Tony Lacavera and Mirek Nawrot. Front row l.-r.: Rishi Bahall, Gianni Creta, Ashvinder Brar, Anthony Cozzi and Peter Spinato.

The early days of establishing the business came after working our regular day jobs. We'd get together in the evenings to investigate and refine the idea. We recognized that the key was to commercialize it in order to run a successful business."

"We also knew we needed financing," notes Sit, who came into this venture after working for several years as an investment banker. "But we decided that the best way to build a company was to develop a product and focus on executing the business plan first. If all you are concerned about is securing financing, you'll neglect the fundamentals of the business. Our company has always been 100% self funded, first through our own pockets and then through cash flow."

While the company is now profitable and on a strong growth trajectory, Sit and Choi are aware that there will be other challenges ahead. "We know that we can't become a giant success story overnight," says Choi. Instead, the plan is to expand intelligently and

focus on controlled growth, while being aware that their products will need to evolve to suit the changing marketplace. "We will succeed only if our products and services continue to satisfy our customers' needs."

AT a time when some big name hardware and service providers in the telecom sector are downsizing and struggling with heavy debt and flat demand, how is it that Canopco Inc. has experienced a 4,500% growth in sales since its inception four years ago? Tony Lacavera (BASc Comp 9T7), President, CEO and Co-Founder of the private telecommunications company that got its start serving the hospitality industry, has a few thoughts on the matter.

"When we started Canopco, we saw the opportunity that the deregulation of the telecom industry created. We developed a service offering based on proprietary software to supply operator services to the new, competitive local exchange carriers that were

looking to compete with Bell. It didn't take long to realize that due to our size, we couldn't compete effectively by trying to be everything to everyone," admits Lacavera. "What's more, virtually every competitive local exchange carrier was going bankrupt. To get the company back on track, we changed Canopco's focus, targeting the hospitality sector with similar services."

Canopco, a 64-person company with sales expected to reach \$23M in 2002, was ranked as one of Canada's five hottest start-up companies by *Profit Magazine* in 2001. The company provides operator services (such as live and automated directory assistance in three languages), long distance calling card services, and teleconferencing to over 75,000 rooms in 1,000 hotels around the world including Fairmont Hotels and Resorts, Delta Hotels and Six Continents Hotels. The company handles and transports all calling card calls from the hotels and manages the billing, offering hotels a share of the revenues from the services billed to their guests. Not a bad concept, considering that Lacavera estimates the hospitality operator services market to generate \$2B USD annually and to grow at a rate of 5% per year over the next five years.

But domestic hotels are only a fraction of the business. In addition, Canopco licenses its proprietary call-handling and call-routing software to foreign telecom companies that serve hotels overseas. "We've deployed our software platform to customers in Mexico and Jamaica, at times beating out others like Lucent and Nortel," notes Lacavera. "This is a direct credit to our technology team."

Among its core are six other UofT engineers, including Gianni Creta (BAsC Comp 9T8) who is the Executive Vice-President of the company. As the lead architect of Canopco's soft-switching technology, Creta is responsible for the product roadmap as well as Canopco's relationships with carrier licensees. "Gianni and the rest of our technology team are brilliant. We have accomplished more than many telecom service providers that have over 100 times our capital resources. Most of these guys graduated within the top five of their class," says Lacavera.

So, what does the future hold in store? "We started as a reseller with some unique software and piece by piece, through engineering software development, we've turned ourselves into an application provider. Either we eventually start cutting suppliers out of our components to move up the value chain, or we end up selling the company." While this remains to be seen, there seems to be no doubt that Canopco will continue with its proven method of discovering and capitalizing on business opportunities as they emerge.

ASK founder and former CEO of FloNetwork, Paul Chen (BAsC Elec 8T8) for some wisdom about running a start-up and he'll tell you, "You'll rarely end up with the same product you started out with." What began as Media Synergy in 1993, whose first product was a CD ROM driver for Windows NT, morphed several times before becoming FloNetwork, an Application Service Provider that specialized in online direct marketing via e-mail. When Chen sold the company in 2001, it had grown to 220 people in size with revenues of \$20M.

"Throughout the process, you make a lot of mistakes and you learn a lot of lessons," says Chen. "When I started, I had products to sell without a cohesive long-term vision for the company. By 1995, I realized that what we were doing wouldn't result in significant growth. So we started thinking about new areas in which to build products. E-mail seemed to be the next wave to catch." The initial idea was multimedia e-mail cards – allowing people to drag and draw animations to create personal greetings that could be sent electronically to friends. While Chen started the company with his own money and that of family and friends, by 1996 he realized he'd need additional financing. "The goal was to raise \$1M. I was so naïve at the time. I thought that would be enough," laughs Chen, "only to find out that \$16M later, the company still needed more investment."

"By 1997 I realized that we couldn't compete with the big players in the consumer market, so we dropped everything and changed

“We couldn't **compete** effectively by trying to be everything to everyone.”

The technology team is now working on revamping their year-old software for web-conferencing. The plan is to integrate it with a call centre in North Bay, to provide customers with both a technical assistant and an executive assistant for the duration of the call, resulting in high touch service and fewer technical difficulties.

In July this year, Canopco launched another software package, enabling it to compete with Canada Direct in offering access cards to international travellers to assist them in placing their long distance calls. What's unique about Canopco's approach is that it uses travel agents as the sales people. "Travel agents were looking for new ways to earn revenue," Lacavera explains. "We offer them a commission to give people our card instead of Teleglobe's Canada Direct card. Given their recent cut in commissions from the airlines, I guess it shouldn't be a surprise that we've had a 100% sign up rate with the travel agents we've contacted."

our focus to business-to-business applications." FloNetwork began providing the technology infrastructure, software and services for businesses to market to and communicate with customers on the Internet. "One of our clients, Continental Airlines, wanted to send out an e-mail each Wednesday to a million customers informing them of last minute ticket deals for the upcoming weekend. The information wouldn't be available until the night before, so our service had to be fast and reliable. We also needed to be able to track the response to produce a comprehensive report that would let the airline know how much it made on the campaign."

Chen notes that in addition to the technology, customer service was key to the company's success. "We never lost a customer," he notes. "We built a culture where we'd do whatever they asked, even if it wasn't specified in the contract. The downfall of course, was crazy hours and customers calling you at home in the middle of the night."

“You can never have enough **experience.**”



The final transition point for Chen came in 1999 when he realized that he should no longer be the company’s CEO. “I knew that if we wanted to take the company to the next level, someone more qualified should do the job.” Chen found his own replacement in his mentor, Eric Goodwin, who first joined the company as a consultant, and later was convinced to take over the reins.

Chen does credit his engineering education with providing at least some of what he needed to succeed. “I learned that technology is always changing and how to learn on my own to keep pace. I used to skip classes, which meant that I had to teach myself in order to prepare for all the exams.”

Chen is now Entrepreneur in Residence at McLean Watson, a venture capital firm based in Toronto, where he uncovers new start-ups and shares what he learned with the companies in the fund portfolio. “Mainly I’m trying to figure out what will be the next opportunity I want to be involved in. While some like to join companies at the early or late stage, my preference is to build from the ground up.”

And the final lesson Chen plans to take with him when he does? “You can never have enough experience. All that you can hope is that you don’t make the same mistakes again, or at least you recognize them earlier when you do.”



T H E U N I V E R S I T Y O F T O R O N T O

PHYSICAL ASSET MANAGEMENT CERTIFICATE PROGRAM

Doing the right maintenance,
making the right decisions

BY CLAIRE MAJOR

Enrolling in an eight-day training program designed to help managers make the most of their companies' physical assets has proven to be a sound business decision for the many industrial executives from around the world who enthusiastically endorse this specialized course. The University of Toronto Physical Asset Management Certificate Program is offered by the Professional Development Centre (PDC) in partnership with PwC Consulting.

Participants in mining, manufacturing, utilities companies, and other industries who have taken this program have called it a "must". It has attracted attendees from across Canada, South Africa, Peru, and Argentina. Participants have stated that the course provides "a good understanding of modern technology and continuous improvement techniques that can be used to improve the business process."

The program focuses on the distinctive needs of companies whose profitability is heavily dependent on physical assets – companies that use machinery, equipment and fleets to extract resources, that process or produce goods and commodities for market, or that need to move materials and people around, often over long distances. The program highlights the importance of asset management and its effect on the profitability, safety and environmental considerations of doing business.

Leslie Dolman, Director of the PDC, said, "This program provides plant managers and engineers with the skills required to perform efficient asset management. We also recognize that they need the support of senior management to really be effective. This year we are expanding our Physical Asset Management (PAM) offerings to include executive programs that make the business case for PAM, as well as events for current and past

participants. Doing the right maintenance and making the right decisions has never been more critical."

The PDC has customized its PAM program to serve the needs of clients including Manitoba Hydro and Irving Pulp and Paper. The program has received international recognition. Last year the PDC was requested to make it available through the University of Western Australia in Perth.

The PDC offers certificate and diploma programs developed with input from professionals and associations, in response to industry needs. UofT faculty and industry experts oversee the curriculum.

The University of Toronto Physical Asset Management Certificate Program is offered over eight consecutive days in November 2002 or in eight days spread over a four-month period, February through May, 2003. Visit www.pdc.utoronto.ca for full course descriptions.

www.pdc.utoronto.ca



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A business of PRICEWATERHOUSECOOPERS

SILVER GOLD

BY RUTH WEINSTOCK

INNOVATIVE YOUNG GRADS WIN GOVERNOR GENERAL'S MEDALS



New ideas, new methodologies and new ways of solving problems – that's what propelled Phillip Tan and Ryan Fung to become 2002 Governor General's award winners.

Tan, who just received his PhD from the Department of Chemical Engineering and Applied Chemistry, won the Gold Medal. He is now working in Maryland as an Instrumentation R&D Engineer for MassTech Inc., a small start-up company. The Silver Governor General's Medal was awarded to Ryan Fung, who just earned his BAsC in Engineering Science. Fung, who is now working at the Altera Toronto Technology Centre, a branch of one of the world's leading companies in the field of programmable logic devices, also

Phillip hopes the LAMS will ultimately help to identify the causal agents of illness resulting from air pollution.



Ryan can hold many concepts in his mind at once and drive towards excellent solutions.

won this year's Professional Engineers of Ontario Gold Medal.

Tan wrote an innovative doctoral thesis on building an instrument that can instantly assess individual particles of air pollution. His objective was to answer unsolved questions regarding the chemical components that make up the noxious soup known as smog, and to develop a means to determine where they originate. Professor Greg Evans, Tan's thesis supervisor, calls these twin goals of determining both the source and the composition of the particles, "comprehensive characterization".

The instrument Tan assembled from scratch, called an aerosol Laser Ablation Mass Spectrometer (LAMS), is the first of its kind in Canada and among only a handful around the world. The analysis takes place in real-time and results are linked to a Web site, allowing someone who's in France, for example, to log on and see today's air quality in Toronto.

Current methods for monitoring particulates usually involve capturing the particles on filter paper over a 24-hour period. Unlike Tan's approach, this takes time and can't provide information about the critical organic components of the pollutants. Tan also built

a database of each particle's chemical characteristics, which act like a rough "fingerprint", pointing to where a particle came from. His work may eventually be able to pinpoint the geographic sources of pollution – in particular, pollution likely emanating from the United States.

Tan hopes the LAMS will ultimately help to identify the causal agents of illness resulting from air pollution, that especially affects sensitive groups such as children, the elderly and people with asthma. While he has moved on to developing new technologies in his current work in Maryland, the Canadian-born-and-raised alumnus hopes to someday return to live and work in Toronto.

When Professor Jonathan Rose, Chair of the computer option in the Division of Engineering Science, talks about Ryan Fung's ability and accomplishments his excitement is palpable.

"He's an amazing guy," stated Rose, who is also Co-Director (with ECE Professor Stephen Brown) of the Toronto-based branch of Altera, where Fung is employed. The company is headquartered in San Jose, California and employs 2,000 people in 13 countries.

Rose hired Fung in May, 2000 to do his Professional Experience Year at the pioneering firm and also later supervised his fourth year thesis on automating the design of programmable logic chips. "It would take 150 people one year each to design what Ryan's work may someday enable us to accomplish in a day," Rose explained. Forty-nine of the 50 engineers employed there are Faculty graduates.

"What Ryan is able to do is astonishing. He is so brilliant," Rose said. "We throw the really tough problems at him. He can hold so many concepts in his mind at once and drive towards excellent solutions."

A team, including Rose and Fung, is writing a paper they hope to present at the International Symposium on Field-Programmable Gate Arrays in Monterey, California this fall. Rose calls Ryan's contribution to the paper "a huge leap" that points to ways for saving substantial time and money in the multi-billion dollar microchip industry.

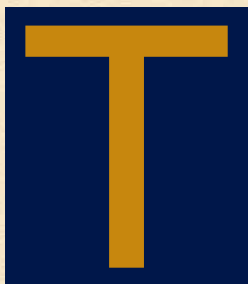
Fung says the "breadth" of the Faculty's Engineering Science program attracted him, and praised those professors who encouraged ingenuity, not just correct answers. He is extremely humble about his extensive accomplishments, insisting, "There is nothing really special about me" and attributing his good fortune to his faith. It's not surprising to learn that he was also Ontario's top high school student in 1997.

Professor Rose sees a bright future for Ryan at Altera. "I am sure he'll take on technical leadership of key corporate priorities."

175

CELEBRATING
175 YEARS OF
GREAT MINDS

BY RUTH WEINSTOCK



This is a milestone year for the University of Toronto – its 175th anniversary.

On March 15, 1827, King George IV signed a charter creating King’s College,

the forerunner of today’s UofT. It’s an appropriate time to recognize the

accomplished alumni of the Faculty who have contributed so greatly to the university’s reputation

for developing “Great Minds”. Our thousands of graduates ably represent our history of leadership

and achievement. Space permits us to list only a few out of the many who could equally exemplify

our rich history. All have, over the years, given this Faculty so very much to be proud of.

1883 Civ **George Herrick Duggan** Internationally acclaimed for bridge engineering and as a yachtsman. Earned International Cup in a vessel of his own design.

1886 Civ **Thomas K. Thomson** Helped create many of Manhattan's skyscrapers, bridges and tunnels. Instrumental in founding the Engineering Society at S.P.S. as a student.

1889 Mining **H.E.T. Haultain** His mining career included the invention of devices used worldwide, the superpanner and the infrasizer. A leader in establishing the 'iron ring ceremony' for graduating engineers.

1890 Mech and Elec **Robert Alexander Ross** First (and solo) graduate, School of Practical Science (S.P.S.). Consulted on major municipal projects in Asia, Europe and North America. Founding member, Chair, National Research Council.

0T6 Civ **Edward Lancelot Cousins** Consulted on the development of world class ports, including New York City's Port Authority. Commander of the Order of the British Empire. Toronto's harbour and waterfront, which he planned, is his living monument.

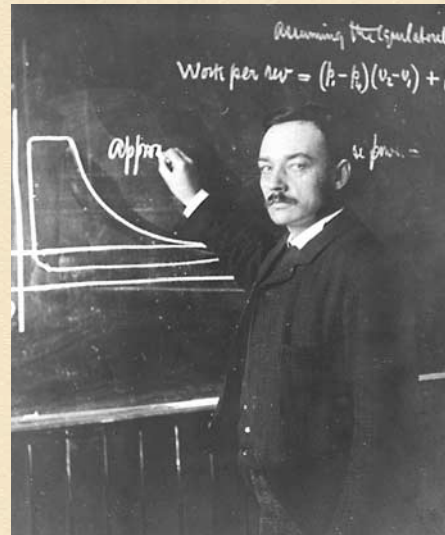
0T8 **Charles Wright** Invented the "trench wireless", used extensively during WWI. Helped develop radar during WWII. A member

of Scott's Expedition to Antarctica, he discovered his leader's body.

0T9 Civ **Harry Tate** Played a key role in development of the TTC and Canada's first subway line. Received the M.B.E. for his service in both world wars.

IT2 Chem **Hildegarde E. Scott** First, and for some years, only woman to graduate from S.P.S.

IT3 Civ **Richard Hearn**, Chair, Ontario Hydro-electric Power Commission. Brock University's first Chancellor. Also prominent in hydro-electric development were: **Thomas Hogg** (0T8 Civ), **Otto Holden** (1T3 Civ) and **Percy Dobson** (1T5 Elec).



John Galbraith, the Faculty's first Dean.

IT7 **Alvan Mathers** Chair, National Capital Commission. President, Toronto Board of Trade. Elected to France's Academie D'Architecture. With **Eric Haldenby** (2T1), erected buildings that today define Toronto's skyline. Restored Ottawa's Parliament buildings.

2T1 Elec **Edward S. Rogers Sr.** Radio electronics pioneer. Enrolled in the Faculty, 1919-21, he left before graduation to pursue his career in radio experimentation. First to invent batteryless radio receiver, power rectifier pentad tube and spray-shield tube. Started world's first all-electric radio station, CFRB. First Canadian amateur radio operator to transmit a signal across the Atlantic.

2T4 Mech **Ralph Keebler** VP, Bell Telephone Co. and Chair, Northern Electric (now Northern Telecom). President, Canadian Chamber of Commerce. Granted Legion of Honour and France's Croix de Guerre Avec Palme for valour as a Canadian armed forces Major General.

2T7 Elec **Elizabeth Gregory MacGill** The first female aircraft designer in the world. First Canadian woman to earn an electrical engineering degree. First North American woman to earn a degree in aeronautical engineering (1929, University of Michigan). Her Maple Leaf II trainer is likely the only plane completely designed by a woman. Also collaborated on the Hawker Hurricane, used for defense in WWII.

2T7 Mech **Fraser W. Bruce** President and Director, Aluminum Company of Canada (ALCAN). Contributions to the war effort. Charter Chair, Canadian Executive Service Overseas (CESO). Star athlete.

2T8 Elec **Frank Henry Ralph Pounsett** Designed the first car radio for General Motors of Canada. Advised Washington in WWII on radar. VP, Philips Electronics Industries. Helped establish Centennial College of Applied Arts and Technology. Dean of its Engineering Technology division.

2T8 Mech **Beverly Strachan Shenstone** Collaborated on the design of the renowned Spitfire aircraft that contributed to victory in the Battle of Britain.



The School of Practical Science building, c. 1904.

Later, a consultant to Canadair, A.V. Roe (Canada), British European Airways and British Overseas Airways Corporation. President, Royal Aeronautical Society.

3T5 Civ **Marsh Cooper** President and CEO, Falconbridge Nickel Mines Limited. Notable role in the evaluation and development or operation of mines worldwide. Fellow, Society of Economic Geologists and also Geological Society of Canada. Supporter of engineering education and research. A double graduate of the Faculty. R.C.A.F. Flight Lieutenant.

3T6 Metallurgy **Kenneth Clarke** International Chair, Pacific Basin Economic Council. Opened markets to Communist China as Inco's Vice President of Marketing. U.N. delegate. President, Stratford Festival Foundation.

3T9 Mech **Paul Dilworth** and **Winnett Boyd**. Together they developed Canada's first jet engine, the Chinook, in the late 1940's.

4T3 Elec **James Ham** 10th President, UofT, 1978-83. Chair, World Federation of Engineering Organizations. Nine Honourary Doctorates. Co-founder, Canadian Institute for Advanced Research (CIAR), the basis of Federal and Provincial Centres of Excellence.

4T3 Metallurgy **Gerald Heffernan** Pioneer steelmaking inventor and entrepreneur. Business success in North America, the U.K. and beyond. Co-founder, UofT Innovations Foundation, Canadian Institute for Advanced Research.

4T5 Civ **Robert Booth** Chair, Carruthers and Wallace Ltd. Known for solving difficult structural design problems. Recognized for his work on the T.D. and Eaton Centres, Commerce Court, Roy Thomson Hall, Toronto Hospital, Robarts Library, among many others. Prominent in professional organizations.

4T5 Civ **George Keary** Entrepreneur, sportsman, humanitarian. Head of Internorth Construction Company. Best known for leadership of programs for disabled skiers. Founder, Ontario Track Three Ski Association. Acclaimed for 30 years



Dean R.R. McLaughlin teaching chemistry, c. 1958.

of competing, coaching and organizing in Canadian sailing.

4T5 Metallurgy **Burnett M. Thall** Started as a researcher in atomic energy. Senior V.P. and Director, Torstar. Director, Banting Institute. On Boards of Women's College Hospital, Ontario Cancer Treatment and Research Foundation.

4T5 Civ **Donald MacDonald** Technical innovation in hydroelectric and dam projects across Canada. Solved many civil engineering problems, including a precedent-setting concrete-faced-rock-fill dam and work on water-retaining structures in areas of permafrost. His student papers on the problem of settling of buildings are still referred to in current practice. Served on many international commissions. Shaw Theatre Festival Board member.

4T5 Civ **William Gordon Tamblin** Numerous humanitarian projects, beginning with the construction of missions in China. Lead role in the creation of Lakehead University. Its first President and Vice-Chancellor. President, Great Lakes Steel Construction.

4T6 Mech **Burton Avery** Propelled Canada to international fame in aircraft design. Chief design engineer at Hawker Siddeley Canada Limited during the production



Then Dean, James Ham, second from left, with associates in 1972.

of the Chinook and the Iroquois jet engines. Worked on the Arrow. Fellow, Canadian Aeronautical Institute.

4T7 Mining **C. William Daniel** President and CEO, Shell Canada. Tireless volunteer. Numerous contributions to strengthening the Faculty. Varsity athlete. APEO Citizenship Award.

4T7 Mech **Keith Hendrick** President and Chair, Noranda Minerals Inc. Outstanding contributions to Canada's primary industries. Athlete. President, AGO. Rhodes Scholar.

4T9 Civ **William Andrew O'Neil** President and CEO, St. Lawrence Seaway, which he helped engineer and design. Secretary-General, The International Maritime Organization (IMO). Chancellor of the World Maritime University in Sweden. Credited with promoting the safety of working sailors at sea.

4T9 Metallurgy **William Winegard** Minister of State for Science and Technology. President and Vice-Chancellor, University of Guelph. Chair, Council of Ontario Universities and Ontario Council of University Affairs. Over 100 papers.

5T0 Chem **Lew Urry** Developed the first commercially viable alkaline battery, which evolved into the Energizer battery. His alkaline D cell prototype is in the Smithsonian in the same room as Edison's lightbulb. Voted one of the 100 greatest inventions of the millennium, by the magazine *Popular Science*. Over 50 patents.

5T0 Chem **Robert Richardson** Rose from technical assistant to President, Board Chairman and CEO of DuPont Canada. Noteworthy advisor to engineering faculties at many universities, including McGill and MIT.

5T1 Eng Bus **William Turner Jr.** President, Power Corporation. President, CEO and Chair, Consolidated Bathurst Inc. Chair, SNC-Lavalin. Contributor to World Economic Forum, Stratford Festival. Son of the founder of the Engineering Alumni Council.

5T2 Mech **Bohoan Hawrylyshyn** Director, Geneva's International Management Institute. Fellow, World Academy of Art and Science. Member, Club of Rome. Lectures in over 40 countries. U.N. relief work

5T2 Elec **Peter Munk** Chair and CEO, TrizecHahn Corporation, Barrick Gold Corporation and Australia's Southern Pacific Hotel Corporation. Canadian Business Hall of Fame. Patron of education, medicine and the arts.

5T3 Mech **Ernest Dainty** Acclaimed worldwide for his leadership of a team of U.S. and Canadian scientists that developed a practical

ceramic particulate filter for diesel engine emissions. Directed the transfer of this technology to produce a mine-filtering system credited with protecting underground workers from the hazards of diesel fumes. Renowned for contributions to mining health and safety in his work with Federal Department of Energy, Mines and Resources.

5T4 Civ **John Bahen** President and CEO, Peter Kiewit Sons Co. Ltd. Changed the face of the nation through construction of projects, including mass-transit systems in Montreal, Toronto and Vancouver, James Bay hydro facility and the Hibernia oil-drilling platform. Tireless volunteer.

5T5 Civ **Joseph Tanenbaum** President and CEO, York Steel and other companies. Patron of arts, education, health.



The Mechanical Engineering Building.

6T2 Chem **Paul Godfrey** President and CEO, Sunmedia Corporation. Publisher, Toronto Sun. Chair, Metropolitan Toronto Council. Brought the Blue Jays to Toronto. Leadership role in creation of the SkyDome. TTC Commissioner. Trustee, Hospital for Sick Children. Raised millions for the lifesaving Herbie Fund. Saved the Santa Claus Parade.

6T2 Elec **Gedas Sakus** Contributed to communications technology. Rose from a junior manufacturing engineer with Northern Electric to become President of the renamed Northern

Telecom Canada. An architect of Nortel's success in the years 1988-98.

6T8 Chem **Ron Brenneman** President and CEO, Petro-Canada. President, Imperial Oil Limited.

6T9 Elec **Eugene Polistuk**, President and CEO, Celestica, one of the world's largest high-tech outsourcing manufacturers. Celestica is a leading partner in research initiatives in the field. Philanthropist. Volunteer.

7T3 Civ **Paul Cadario** Prominent in business innovation and assisting developing nations in key World Bank posts. President, Associates of UofT. Rhodes Scholar. Dedicated volunteer.

7T5 Eng Sci **Robert Simmonds** Leader and early champion, wireless telecommunications. Executive Vice-President, Regulatory, TELUS Mobility. Co-founder, President, Clearnet Communications Inc. More than 20 years shaping federal wireless digital network policies.

7T7 Elec **Lee Ka Lau** Co-founder, ATI Technologies, a world leader in the graphics-chip industry. Patron, health and education.

8T7 Elec **Jeffrey Skoll** Co-founder, first President and a Director of eBay, the world's largest on-line auction house. Enabled worldwide buying and selling of goods. Widely recognized philanthropic leadership.

9T7 Eng Sci **Isabel Bayrakdarian** Opera singer. Renowned performances at Carnegie Hall and the "Met". First place, 1997 Metropolitan Opera Council auditions, of 2,000 candidates.

0T1 Chem **Naana Afua Jumah** One of three Rhodes Scholars in the Faculty's history. Awarded an NSERC scholarship after second year. On UofT's Governing Council.

Footnote: This article focuses on the Faculty's undergraduate alumni and not on its many illustrious graduate students or faculty members. A virtual time capsule at www.uoft175.utoronto.ca will include some of our many achievers not mentioned here for lack of space.

With thanks for editorial assistance to Professor Gordon Slemon and Dr. Richard White.

MAJOR G



The Campaign for the University of Toronto is the largest university campaign in Canadian history, with a \$1 billion goal. It has set the standard for philanthropy in this country and has provided the university with over \$874 million to date, to help

bring our institution to the forefront of the world's great public universities. Our Faculty of Applied Science and Engineering is an integral component of the University of Toronto's overall success and will be a key factor in elevating UofT's future reputation.

As a part of the Campaign, our Faculty has identified its areas of greatest strength and emerging importance for which we seek support. Our goal is to raise \$125 million by April 30, 2004. With over \$110 million secured to date, our donors have established 28 endowed chairs, funded major endowments for student aid, and provided significant support to create new physical infrastructure to ensure that our researchers and students have the environment they require to excel.

In this final phase of our campaign, we would like to encourage all of the Faculty's alumni, friends, and partners to consider becoming involved if they have not already done so. Your investment and encouragement will help us achieve our ambition of becoming one of the world's top engineering schools.

CINDY YELLE

EXECUTIVE DIRECTOR OF DEVELOPMENT

Footnote: The Faculty of Applied Science and Engineering is grateful for all gifts. We sincerely hope that all donors have been correctly acknowledged in these listings. Please note that we have not included the names of donors who requested anonymity, nor have we included bequests to the Faculty. If, however, your name has been omitted inadvertently, we wish to offer our apologies. We hope that you will contact our Development office at 416-946-3449 so we can correct this oversight.

\$5,000,000 +

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We use the Annual Fund for entrance scholarships, to attract the best and brightest first year students; laboratory improvements for better learning environments and an astonishing range of student projects, competitions and conferences.

Last year, because of your generosity, we were able to fund the student projects listed below. Please check these Web sites to see the wonderful achievements your contributions have supported. It would be our pleasure to give you more information. Many, many thanks to those who have supported our students.

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Concrete Canoe

Competition – The eighth national contest was held for the first time in Toronto last year. An interdisciplinary team of students from Civil, Mechanical, Aerospace, Biomedical, Electrical and Computer Engineering designed and built

a concrete canoe that is less dense than water.
www.concretecanoe.ca

Formula SAE Racing Team

– in July, the team competed in England and came in an impressive second place overall and won five additional awards. They also showcased their

car in the Molson Indy.
www.fsae.utoronto.ca

U of T Blue Sky Solar

Racing Team – placed 12th in the American Solar Challenge, July 2001 and 14th in the World Solar Car Challenge held in Australia in November 2001.
www.blueskysolar.utoronto.ca

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AeroDesign – radio controlled aircraft design competition. Over the next year the team will be working diligently to produce UofT's first undergraduate flying machine!
www.ecf.utoronto.ca/~utaero/

Mining Games – teams from nine mining programs across Canada, competed in ten activities, ranging from mineral identification and mine design to blasting and mine rescue at the games, held in Vancouver last February.
www.ecf.utoronto.ca/~mingames/

Artificial Intelligence Robotics (AIR) – The team is in the process of creating a new set of robots for the Small Sized Soccer League to compete in RoboCup 2003.
www.cs.utoronto.ca/~air

Engineers without Borders – EWB is an international, non-profit organization that applies appropriate technology to solving the challenges of the developing world. The UofT chapter started in Jan. 2001.
<http://toronto.ewb.ca/about.php>

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Ontario Engineering Competition – 24 students participated this year and two teams won first place to go on to the national competition. <http://www.genie.uottawa.ca/~oecl>

National Society of Black Engineers (NSBE) – four students from the UofT chapter attended the NSBE Convention in Orlando, Florida in March 2002. www.ecf.utoronto.ca/~nsbe
Women in Science and Engineering (WISE) – activities included organizing

a High School Outreach program and a seminar on 'Life after Graduation'. www.ecf.utoronto.ca/~wise/
Skule Stage Band – performs at functions including Spring Reunion and the UofT Alumni Association's Annual General meeting.

Engineering Students' Society Council of Ontario (ESSCO) and Canadian Federation of Engineering Students (CFES) – sponsored four students to attend conferences. www.essco.ca www.cfes.ca

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