

ENGINEERING IS ALL AROUND US



Celebrating engineering

ROM's engineering miracle beckons the world

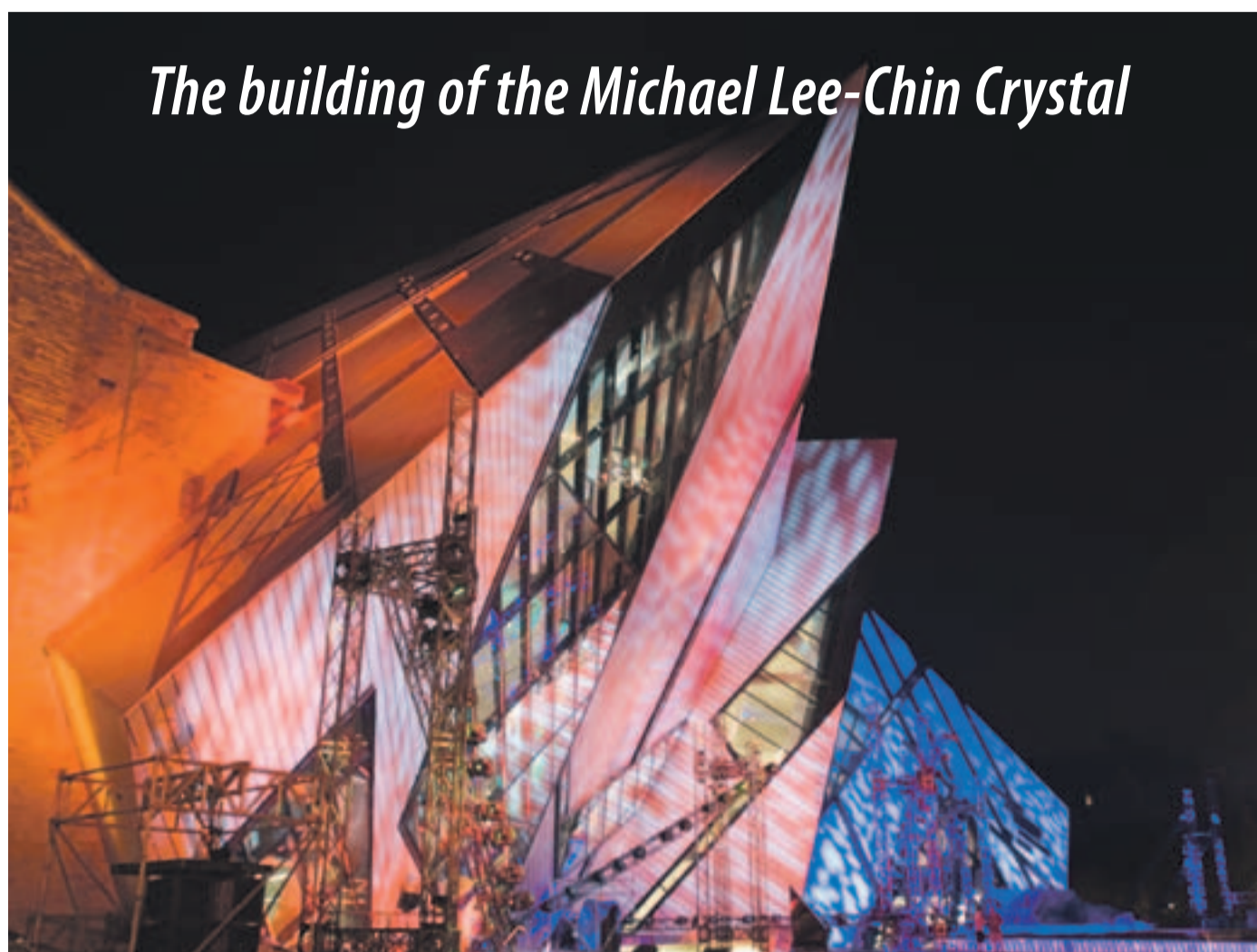
This year, the Ontario Professional Engineers Awards will be housed in a special location – one that took both its engineers and construction team to their limits and beyond: The Michael Lee-Chin Crystal.

"It is exciting to host our annual awards at a venue like the Royal Ontario Museum (ROM); a facility that has been touted for its unique architecture and engineering," says Angela Shama, P.Eng. and CEO of the Ontario Society of Professional Engineers.

The ROM's renowned and controversy-inspiring Crystal was funded in part by civil engineering graduate Michael Lee-Chin, whose \$30-million donation was made in honour of the opportunities Canada gave this native of Jamaica and his family and as an inspiration to young Canadians to become leaders in their own communities.

The Michael Lee-Chin Crystal is a form of ventriloquism, says Dave Hollands, director of design at the ROM. "Through the Crystal, we are able to throw our voice across the world, while sitting on this street corner in Toronto," remarks Mr. Hollands of the \$135-million engineering feat that officially opened in June 2007 after four years of construction.

"After the ROM had



The building of the Michael Lee-Chin Crystal

Michael Lee-Chin Crystal during Architectural Opening celebrations, June 2007. PHOTO: ROYAL ONTARIO MUSEUM

reviewed a whole variety of unexpected possibilities, our current director ran with the idea that we had to do some-

thing dramatically engaging or we'd be in economic decline," says Mr. Hollands.

Part of an ambitious reno-

vation plan called Renaissance ROM – a \$270-million project scheduled for completion in 2010 – the Michael Lee-Chin

Crystal adds 16,000 square metres and six new galleries to the museum.

After an international

search that attracted more than 50 firms, the Berlin-based Studio Daniel Libeskind was chosen to lead the Renaissance ROM team.

Inspired by the ROM's gem and mineral collection, Mr. Libeskind sketched the initial concept for the Crystal on a paper napkin while attending a family wedding at the ROM. He later wrote: "Why should one expect the new addition to the ROM to be 'business as usual?' Architecture in our time is no longer an introvert's business. On the contrary, the creation of communicative, stunning and unexpected architecture signals the bold re-awakening of the civic life of the museum and the city."

Not only does the Michael Lee-Chin Crystal bring innovative social spaces to the fore – with the sophisticated c5 Restaurant Lounge and health- and earth-friendly Food Studio restaurant – it also demanded innovative engineering and construction techniques.

Considered one of North America's most challenging construction projects for its engineering complexity and innovative methods, the Lee-Chin Crystal is composed of five interlocking, self-supporting prismatic structures that

See Crystal, OPEA 4

Interview with Michael Monette, P.Eng., MBA, EDP, President and Chair of OSPE

Engineers better local, global communities

In keeping with its annual tradition, the Ontario Society of Professional Engineers (OSPE), in partnership with Professional Engineers Ontario (PEO), is hosting the Professional Engineers Awards – celebrating engineering achievement in research and development, management, entrepreneurship and engineering excellence.

"The noble profession of engineering benefits from recognizing its members who are role models in demonstrating professional values and characteristics of the engineer in today's society," says Michael



Monette, president and chair of OSPE. "These characteristics are quite broad and remarkable as engineers practice their art, craft and science to the betterment of our communities throughout Ontario, with impacts felt across the globe."

Drawing its members from engineering graduates and PEO membership, Mr.

Monette says OSPE is the "voice of Ontario's engineers," through such outlets as OSPE's Centre of Engineering Excellence, which promotes engineering excellence through advocacy, public policy development, career services and continuing education.

"Our advocacy activities enhance the professional recognition of Ontario's engineers in the eyes of government and employers through deliberate engagement with Members of Parliament," he says. For example, OSPE's Political Action Network made over 200 presentations

to the Ontario government, this year alone, on issues such as research and innovation, quality-based selection, foreign-trained engineers, labour force/job supply, safe water and energy infrastructure as well as solid waste management.

On October 16th, OSPE hosted Engineering in a Climate of Change – an international symposium. "I would say all Canadians should have heard Dr. Ron Prinn, director of MIT's Centre for Global Change Science, expound on the science and realities of climate change sources and impacts during the opening

session," says Mr. Monette. "It was truly a call for action."

"On a broader scale, OSPE is working more closely than ever before with Engineers Canada to increase the

impact of our advocacy programs," says Mr. Monette, adding that OSPE's initiatives will continue to go, "wherever the issues of the day demand."

2008 ONTARIO PROFESSIONAL ENGINEERS AWARDS GALA

NOVEMBER 15, 2008 – ROYAL ONTARIO MUSEUM

The Ontario Professional Engineers Awards began in 1947, and 61 years later, still recognizes the crème de la crème of professional engineers. The volunteer Awards Committee represents engineers from across the province – from industry, academia and government. Professional engineers must be nominated by their peers, and, if selected by the committee, are recognized for their outstanding achievements in engineering excellence and community service.

FOR TICKETS visit www.ospe.on.ca

Interview with J. David Adams, PhD, P.Eng., President, Professional Engineers Ontario

New centre to engage engineers for public good

The new Ontario Centre for Engineering and Public Policy will provide decision-makers in the Ontario government with expert, unbiased advice to help solve society's technical challenges, says J. David Adams, P.Eng., president of Professional Engineers Ontario (PEO).

"In recent years, PEO has fostered a new era of political



activism for the association and its licence holders," Mr. Adams continues. "The creation of the Ontario Centre for Engineer-

ing and Public Policy will better serve and protect the public interest by more fully engaging the engineering profession in developing public policy."

Formally introduced at a PEO-hosted reception for MPPs at Queen's Park last month, and supported by Ontario's Attorney General, the Hon. Chris Bentley, the centre is designed to focus on

developing policy papers and related research to bring engineers' collective learning to bear where it's needed. It is envisioned the centre will eventually be entirely independent of PEO, to which PEO and others such as the universities and organizations like Engineers Canada and the Ontario Society of Professional Engineers would belong, and

that it would publish a journal dedicated to the engineering and public policy link.

Mr. Adams is optimistic about the profession's ability to be a source of sound technical advice to government policy-makers.

"We believe at PEO that we should be supporting our MPPs through the presentation of position papers on major societal issues with large technical components," he says. "As the regulator of the profession in Ontario, it is our duty to

make the most of the expertise of our members for the public good and to become trusted advisors to government."

The centre will also further the reach of PEO's Government Liaison Program, which was formed in 2005 to promote the benefit of a self-regulating engineering profession to government, in particular self-regulation's contribution to maintaining a high level of professionalism among engineers working in the public interest.

OPEA 2

What's inside

Getting to know today's award-winning engineering leaders.

OPEA 4

The personal story of Michael Lee-Chin, an engineering graduate and philanthropist.

OPEA 5

Hot, new careers in engineering are boosting this long-standing profession's "it" factor.

As an engineer, your contribution is too often seen
but not heard

2008 Ontario Professional Engineers



William (Bill) Altenhof, PhD, P.Eng.
Associate Professor, Mechanical, Automotive and Materials Engineering, University of Windsor

YOUNG ENGINEER AWARD

It is tremendously rewarding if my contributions can help people in Canada or even the world," says Dr. Bill Altenhof, recipient of a Young Engineer Award.

Dr. Altenhof has studied metal fatigue in the structures of trucks that transport cars, which has helped enhance the safety and efficiency of his region's largest industry. His current focus on designs for energy dissipation systems are being implemented in safety harness systems, most notably (but not limited to) child seat safety applications.

"Children require special attention when it comes to vehicle safety. Safety systems for adults are not necessarily appropriate for children. We are working on safety aspects that can reduce the energy that a child's body might see in a crash. We can't prevent accidents from happening, but through our research, we can significantly reduce the injury potential," adds Dr. Altenhof.



Constantin Christopoulos, PhD, P.Eng.
*Associate Professor of Civil Engineering, University of Toronto
Academic Director, Structures Laboratories, University of Toronto*

YOUNG ENGINEER AWARD

Most Canadians wouldn't have Montreal on their list of probable earthquake sites. But it was while growing up in that city that Dr. Constantin Christopoulos, recipient of a Young Engineer Award, was first intrigued by the potential seismic risk looming over critical infrastructure.

"There was concern about the seismic performance of hydro electric dams that were aging, and that was my first plunge into the area of earthquake engineering. It is the ultimate challenge for a structural engineer because it involves balancing cost against the safety of a very rare event."

Dr. Christopoulos oversees a research group at the University of Toronto focused on developing high-performance, earthquake-resistant systems. The group is internationally recognized for myriad initiatives, including development of new damping systems that significantly improve the response of structures to seismic loading.

"It is a challenge unlike any other type of loading. You must allow the structure to sustain controlled damage, but find a way to keep it standing up to save people's lives," he adds.



Alistair Edward Davie, P.Eng.
Vice President, Comtek Advanced Structures

RESEARCH & DEVELOPMENT AWARD

Alistair Davie is vice president of a fast-paced business called Comtek Advanced Structures – the Canadian leader in advanced composites technology.

Its light, low-cost, high-performance composites have revolutionized the world of aviation industry components. Bombardier's regional jet programs and the passenger evacuation system on the double-deck Airbus 380 are among the users of the firm's special manufacturing processes.

A boyhood fascination with model airplanes naturally progressed into Mr. Davie's current aerospace engineering career.

Despite his involvement with research and development, he says, "I'm more of an innovator who devises solutions to aviation problems and knows how to connect the dots to get innovative ideas into the industry."

Donning several hats, he develops the direction of Comtek's technology research and signs off on aviation safety requirements. Delegated by Transport Canada with authority to signify such airworthiness for his firm and other clients – he is also involved with several international aviation safety committees. As well, Mr. Davie supports upcoming engineers through his local Professional Engineers Ontario chapter.



Robert Leslie (Bob) Hemmings, PhD, P.Eng.
*President and CEO, Special Separations Applications Inc.
President and Chief Investigator, MicheRo Inc.*

ENGINEERING EXCELLENCE AWARD

Bob Hemmings' career has been at the forefront of Canadian nuclear power generation and fusion power development.

In "retirement" he is president and CEO of Special Separations Applications Inc. (SSAI), which invented a process to separate and purify substances – including taking tritium from water or "heavy water." In addition, as president and chief investigator of MicheRo Inc., he undertakes special studies for clients – and still finds time to travel extensively with his wife.

Dr. Hemmings has worked in more than 20 countries doing research, commissioning, remediation, cleanup and dealing with the special treatment for mixed waste. He has worked on projects using Canadian-developed technology to clean up nuclear plants in Canada, the United States and overseas.

"It's been extremely satisfying. I started in the industry in the '60s, involved in initial studies on small fission reactors, and finished my career looking at the largest international fusion reactors that have the potential, one day, to solve our energy problems."



Mark J. Hundert, P.Eng.
National Director, Hay Group Health Care Consulting

MANAGEMENT AWARD

Over the past 25 years, Mark Hundert has had a hand in many key undertakings that have influenced how Canadian health care services are planned, managed and funded.

An industrial engineer, he is national director of Hay Group Health Care Consulting, a firm that uses quantitative techniques to analyze the performance of large hospitals. The work touches every facet of care, to help administrators identify areas for improvement.

He has worked on more than 350 major consulting assignments, pioneered a national database to benchmark clinical and operational efficiency and quality of care, and volunteered with several organizations.

Eighteen years ago, during a mid-career break, he spent time helping his children grow up, doing consulting, acting as CEO of the Baycrest Centre for Geriatric Care – as well as coaching baseball and learning to golf.

Entered in the 2008 Canadian Who's Who, he says, "I've been fortunate to have been associated with a lot of outstanding, talented people who have made me look very good."



Raneeh Mahalingam, M.Eng., P.Eng.
Senior Water Engineer, Safe Drinking Water Branch, Ontario Ministry of the Environment

CITIZENSHIP AWARD

When you open your eyes and look, everything you see involves engineering."

That is what Raneeh Mahalingam, recipient of a Citizenship Award, tells her young charges as she volunteers to mentor students as young as elementary school. "I like them to see the possibilities that are open to them and to consider becoming engineers one day."

As the second female civil engineer graduating from the University of Ceylon in Sri Lanka four decades ago, Mahalingam has devoted her life to the betterment of humanity.

While winning awards and recognition throughout her career, she has remained dedicated to helping students and immigrants, as well as communities around the world affected by conflict and disaster. She also works diligently on behalf of the engineering community at large.

"When I came to Canada 23 years ago, some people helped me, and in return, I wanted to help others to succeed in the ways that they want to."



Milos Popovic, PhD, P.Eng.
*Assistant Professor, Institute of Biomaterials and Biomedical Engineering, University of Toronto
Scientist, Toronto Rehabilitation Institute*

RESEARCH & DEVELOPMENT AWARD

Milos Popovic has focused his research on neuroprosthetic systems, using functional electrical stimulation technology to help stroke or spinal cord injury patients.

His work has given a new lease on life to many such patients, enabling some to walk or use their hands again, through the use of a Walkman-sized device that helps to restore or replace the functions of a damaged nervous system.

"The most profound achievement we've made is to show that people who have had a stroke or spinal cord injuries years ago still have the capacity to improve their function," says Dr. Popovic, who was awarded the Toronto Rehabilitation Institute Chair in Spinal Cord Injury Research in 2007.

He and his team of engineers and clinicians are also developing interfaces that use brain signals to control such devices as personal computers, wheelchairs and robots – one of the first teams in the world to use recordings from the surface of the human brain to control an external device.



Robert Henry Rehder, P.Eng.
Retired

CITIZENSHIP AWARD

Robert Rehder spent 47 years as a respected engineer for General Electric, earning accolades for his creativity and ingenuity.

A winner of a Citizenship Award, he has received other awards for engineering excellence and been recognized by industry and his community for his many contributions. But nothing can compare, Mr. Rehder says, to the feeling that washed over him when he stood in the middle of a ramshackle local pioneer sawmill, and heard the long-forgotten turbines turning for the first time, after decades of neglect.

"The building was dead, and then we finally turned them on. To stand there and feel it come to life was a real thrill," says the passionate Mr. Rehder.

Mr. Rehder's vision to restore and rebuild the Hope Mill in Peterborough began to take shape in 2000. Lumber was cut for the first time in 2006. And, after 10,000 total hours of volunteer effort and myriad donations (orchestrated by Mr. Rehder), the mill is now a demonstration sawmill and museum that everyone can enjoy.



Sohrab Rohani, PhD, P.Eng., FCIC (Fellow of Chemical Institute of Canada)
Professor and Chair, Department of Chemical and Biochemical Engineering, University of Western Ontario

RESEARCH & DEVELOPMENT AWARD

Researcher, professor and chair of the Department of Chemical and Biochemical Engineering at the University of Western Ontario, Sohrab Rohani is a world-renowned expert in industrial crystallization and process control.

"Industrial crystallization has a lot of applications in industry," he says. During his 35-year career, he's worked with potash, food, pharmaceuticals and new catalysts for the energy sector and environmental protection.

He has written 89 papers for international conferences and 140 referred articles for renowned scientific journals, as well as doing considerable research in technology transfer.

In the past 10 years, his work has helped drug companies produce better, more stable drug products. Under his leadership, his department has become a significant force in Canadian chemical engineering – attracting \$37-million worth of grants in the past five years.

With fascinating work, today's supportive environment and an accessible, well-equipped laboratory, Dr. Rohani considers himself fortunate. "I look forward to every workday as much as I do to going home."



Roy Stephen Slack, P.Eng.
President, Cementation Canada Inc.

ENTREPRENEURSHIP AWARD

Ten years ago, Roy Slack started a mining construction company called Cementation Canada Inc., for its U.K.-based parent.

Adding engineers to contracts, Mr. Slack headed off construction difficulties during the design phase and established successful long-term working relationships.

Under his presidency, Cementation currently boasts almost 1,500 employees and gross revenues of \$255 million in the last fiscal year, with forecasts of \$300 million for next year. North American customers benefit from the company's technical innovations experiencing increased productivity and safety, and lower costs.

Active in the community, particularly as local branch chairman of the Canadian Institute of Mining, Mr. Slack's role at work has shifted from front-line to executive management – handling strategy, capital and acquisitions.

"It's gratifying. As an entrepreneur, I look at the long-term view and commit to that vision, and I still play an important role in safety and human resources."

Among the firm's kudos are 2007 and 2008 surveys in Maclean's that called Cementation one of Canada's top 100 employers.



**Professional Engineers
Ontario**



**ONTARIO
SOCIETY
OF PROFESSIONAL
ENGINEERS**



award recipients



Harold Usher, DTM, P.Eng.
Councillor, City of London



John T. W. Yeow, PhD, P.Eng.
Assistant Professor, Department of Systems Design Engineering, University of Waterloo



Walter Curlook, CM, PhD, D.Sc., D.Eng., FCAE, P.Eng.
*Management Consultant
Distinguished Adjunct Professor, University of Toronto*

CITIZENSHIP AWARD

Harold Usher, recipient of a Citizenship Award, arrived in Canada from Jamaica in 1970 (originally from Belize) with \$300 in his pocket and big dreams.

He worked hard, and soon, through organizations such as the Jaycees and Toastmasters, and on his own, he reached out to help others. He has received numerous awards for his service to the community, and in 1992, received the Canada 125th Commemorative Medal from the Governor General for service to his community, his country and Canadians.

“I have never achieved anything all by myself,” Mr. Usher says. “There was always someone helping me, like an angel, to the next step, to move me from one level to the next. I was brought up in Belize where, as a child, I didn’t even have shoes to wear...and today I watch with empathy newcomers to Canada struggle. As a result, I make it my mission to inspire and empower individuals to better their way of life.”

YOUNG ENGINEER AWARD

John Yeow, recipient of a Young Engineer Award, first became interested in medicine while working part-time in the radiation physics department at Princess Margaret Hospital while working on his Ph.D.

“I realized that cancer treatment planning can be vastly improved by engineering new biomedical instruments,” he explains.

Dr. Yeow’s research is focused on designing miniaturized radiation dosimeters, X-ray devices and endoscopes, which translates into effective treatment and early diagnosis of diseases.

His lab has recently spun off a startup company, ARTsensing Inc., that commercializes a flexible and transparent radiation sensor technology for radiation oncology applications. The sensor provides a quantitative measure of the effectiveness of radiation treatment. Dr. Yeow hopes to continue to translate research prototypes from his lab to commercialized products in the marketplace.

“The general public can only benefit from inventions and innovations in the universities when they are translated to the clinics,” adds Dr. Yeow.

PROFESSIONAL ENGINEERS GOLD MEDAL

For Walter Curlook, Ph.D., P.Eng., engineering is first and foremost an applied science. It’s not surprising then that numerous technologies and processes Dr. Curlook invented or co-invented – and in 20 cases patented – during his 50-year career with INCO Metals Co., have tangibly changed the face of Canadian mining and metallurgy.

“I believe in the commercial application of science,” says Dr. Curlook. “I want to see that what we’re doing does end up serving society.”

Of his numerous accomplishments, one that gives him the greatest satisfaction is that, as president and CEO of INCO Metals Co., he sponsored and successfully promoted a culture that associated productivity with safety.

“I wanted our company to be the most competitive in the world and knew that to do that we had to have good productivity on an ongoing basis,” says Dr. Curlook. “I had a philosophy and was able to prove that improved safety goes hand-in-hand with improved productivity.”

With Dr. Curlook at the helm, INCO went through a seven-year period in the 1980s where the company doubled output per manshift but reduced loss-time injuries from 16 to an astonishing 1.4 per 200,000 man-hours worked. Behind these improvements, he says, was great engineering – advances in robotic and remote-controlled mining technology as well as simplified, revolutionized mining methods and processes.

Another of his greatest achievements was sponsoring and shepherding the \$600-million sulphur dioxide abatement program in Sudbury – one of the mining industry’s largest environmental projects ever completed.

As one who argues that ongoing learning is essential to maintaining a competitive edge, Dr. Curlook has always worked to foster advanced research in Canada and has encouraged close collaborations between industrial, academic and governmental institutions. He was founding chairman of Sudbury’s Cambrian College of Applied Arts and Technology and, in support of research intended to extend knowledge related to the nature of the universe, helped establish the Sudbury Neutrino Observatory at INCO’s Creighton Mine.

As a post-retirement project, Dr. Curlook relocated to New Caledonia and continued as president of Goro Nickel Co. to help establish the mega Goro nickel project. He was invested as Member of the Order of Canada in 1996, inducted as a Fellow of the Canadian Academy of Engineering in 1988, and into the Canadian Mining Hall of Fame in 1997. Today, he continues to study, research and teach as Distinguished Adjunct Professor in the Department of Materials Science and Engineering at the University of Toronto.

We’re your voice.

OSPE speaks for our profession and acts on behalf of over 70,000 professional engineers and all graduate engineers in the province of Ontario. As an engineering graduate from an accredited/recognized engineering program you are eligible to join

OSPE, and enjoy the benefits membership confers – ready access to continuing education, links to career advancement, advocacy before government, and on a very practical level, substantial savings on car and home insurance.

We’re working for you – the people who make so much possible, and enhance the daily lives of every Canadian. If you’re not already a member, visit our website to see what OSPE can do for you. We think you’ll like the sound of it. www.ospe.on.ca

The Voice of Ontario's Engineers





Professional Engineers
Ontario

Ontario engineers set to gain from new partnership

The Ontario Society of Professional Engineers (OSPE) recently sweetened its member benefits by partnering with McMaster University's Dofasco Centre for Engineering and Public Policy.

"We're really excited about it, as it allows us to clearly raise the profile of the engineering profession and advocate for change at all levels of government," says Angela Shama, CEO of OSPE.

The partnership will include a focus on sustainable energy, particularly in the Great Lakes region, through a series of joint conferences and seminars. Additional seminars already given by OSPE include project management for engineers and seminars designed specifically for internationally trained engineers.



From (left to right): Andrew Hrymak, P.Eng., Director, Walter G. Booth School of Engineering Practice, McMaster University; Angela Shama, P.Eng., OSPE CEO; Gail Krantzberg, Director, Dofasco Centre for Engineering and Public Policy, McMaster University; David Wilkinson, P.Eng., Dean, Faculty of Engineering, McMaster University; Michael Monette, MBA, EDP, P.Eng., OSPE President and Chair; Edwina McGroddy, Executive Director, OSPE Centre of Engineering Excellence. PHOTO: SUPPLIED

Andy Hrymak, director of the Walter G. Booth School of Engineering at McMaster

University, adds, "The partnership is very much in keeping with the mission of the

school, which is to foster and deliver interdisciplinary master's degrees in engineering.

Because the interests are combined, students explore courses in political science and

other social sciences and gain an understanding of the human element in their chosen field of study. They can then be more responsive to public and societal issues."

The conferences and seminars that arise from the partnership will complement the master's degrees, and allow both students and engineering graduates to continue their education and stay current on public policy and issues that affect their profession.

Currently, OSPE serves as the voice of some 70,000 professional engineers in Ontario, advocating with governments and providing opportunities for ongoing professional development and career advancement.

Says Mr. Hrymak, "We are very pleased about the partnership."

Crystal from OPEA 1

are linked to the original ROM building through bridges that allow the Crystal to move independently.

"It really was a unique problem to solve that people hadn't been presented with before – requiring innovation in everything from the software to accommodate the shapes to the steel work," says Mr. Hollands. "Given the nature of the loads and lateral forces, the building frame had incomplete structural integrity until it was completed, so temporary measures had to be taken to hold it intact while it was under construction."

In April 2008, the Condé Nast Traveler selected the Lee-Chin Crystal as one of the seven architectural wonders of

the world – and attract the world it has. Summer 2008 visitor attendance averaged 3,000 per day, with more on the weekends, an increase of 40 per cent year-over-year.

"That is a real tribute to the people who designed, fabricated and built the building," says ROM director and CEO William Thorsell. "The construction company, engineers, steel fabricators and architects all have a lot of pride in the building because it really tested everybody's skill set."

Approximately 3,500 tonnes of steel and 38 tonnes of bolts were used to create the skeleton. The steel beams, each unique in design, range from one to 25 metres in length and

were lifted one by one into their specific angle, creating complicated angle joints, sloped walls and gallery ceilings. It's no wonder that Hamilton-based Walters Group won an award for its steel work on the Crystal.

The tip of the Lee-Chin Crystal is 10 storeys high and overhangs Toronto's Bloor Street at a height equivalent to nine storeys above ground. The exterior is 25 per cent glass and 75 per cent extruded-brushed, aluminum-cladding strips in a warm silver colour.

The Lee-Chin Crystal is described as being a spring-board into the Crystal Age of the ROM, a museum whose long history is rooted at the turn of the 20th Century. ■

MICHAEL LEE-CHIN

The man for whom the Crystal addition of the Royal Ontario Museum (ROM) in Toronto has been named is Michael Lee-Chin – civil engineering graduate and inspiring entrepreneur and philanthropist.

In recognition of his \$30-million donation to the Renaissance Campaign, the museum named the dramatic addition "The Michael Lee-Chin Crystal," calling the interior atrium court the Hyacinth Gloria Chen Crystal Court after Mr. Lee-Chin's mother.

Mr. Lee-Chin came to Canada from Port Antonio, Jamaica, and enrolled in civil engineering at McMaster University in 1970. After graduation, he became a financial advisor with Investors Group.

In 1983, he borrowed money to purchase \$500,000 of Mackenzie Financial stock, and in four years, his stock appreciated to a value of \$3.5 mil-

lion. He used his profits to acquire a small Ontario-based investment firm called AIC Limited, the first in a series of acquisitions for Portland Holdings.

Some 20 years later, AIC's assets surpass \$7 billion, and it is touted as one of the largest privately held mutual fund companies in Canada.

Time has called him one of "Canada's heroes" and Canadian Business one of the richest people in Canada – and he has received an honorary Doctor of Laws degree from McMaster University.

Two principles are at the root of his vision for sustainable growth in business. First, investing in economically substantial businesses and providing exceptional products and services. Second, that businesses must try to improve the social well-being of their communities to "not only do well, but also do good," as a measure of their success.



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Engineering – the new “it” career

Young bloods up the hip factor in long-standing field

Engineers have always known that their careers are exciting and creative.

But it's only recently that the rest of the world is catching on to the impact that engineers have in every aspect of our lives and is seeing engineers in a whole new light.

That recognition has spawned a whole new generation of engineering professionals, who are bringing their ideas and vision into the world in exciting new ways. From practices that make our world safer, ideas that make our environment greener, and sexy new products that lay on the cool factor, today's engineers are creating quite a stir – and taking us all along for the ride.

Across the universe – Engineers Without Borders Engineers Without Borders (EWB) helps people in developing communities gain access to – and incorporate – technologies that will improve their lives.

So, when Jason Teixeira, who was completing his master's at the University of Western Ontario, noticed a sign looking for students to form a local chapter of Engineers Without Borders, he jumped in with both feet.

Mr. Teixeira soon became the first EWB Western Chapter Junior Fellow sent overseas to volunteer on a four-month project in Ghana. There, he worked with the regional water board on various projects, doing everything from documenting best practices, to

evaluating wells and communicating with multiple levels of government.

“When you are working on these kinds of projects and riding your bike or motorcycle into the community with maybe 80 people, you really get to see what it means for the people who are using these water sources,” says Mr. Teixeira.

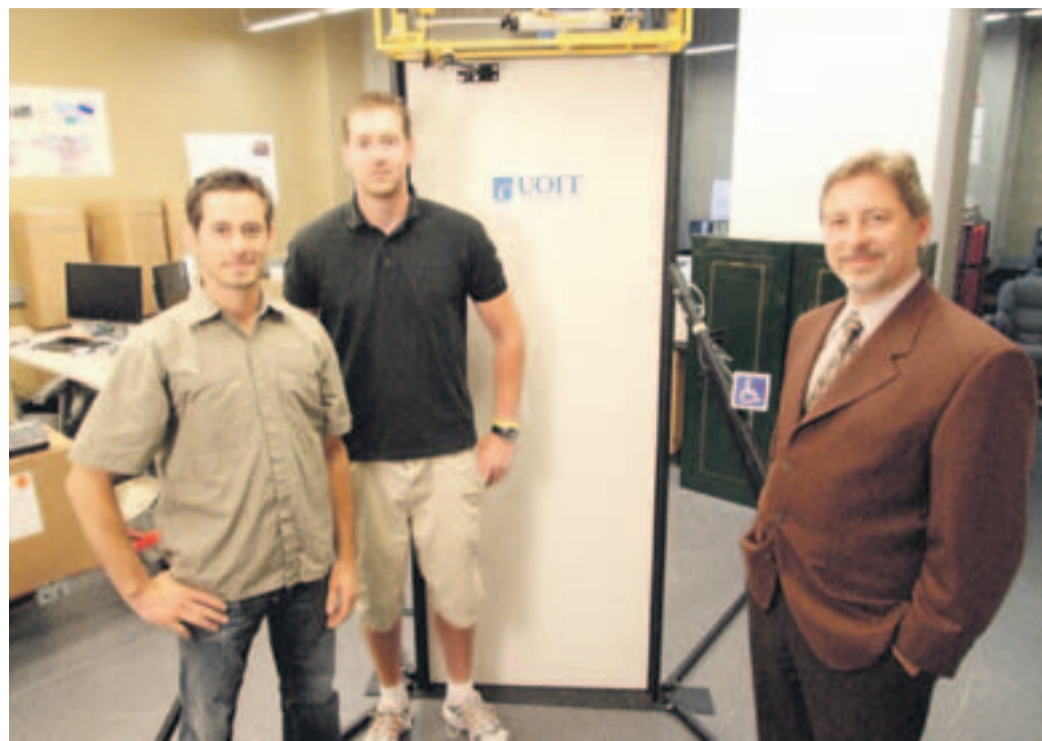
He then spent a year in Malawi, working on the water component of a larger regional project, which involved everything from education to infrastructure. As the myriad elements came to fruition simultaneously, Mr. Teixeira got a crash course in the co-ordination of such a large task, and the roles that engineers must be stretched into, even as they come up against language and cultural barriers.

“We work in many countries, and as we gain experience and knowledge, we can take that knowledge and have it filter down to other countries that we work in,” he adds.

The green door – recapturing lost energy

When it came time for University of Ontario Institute of Technology (UOIT) students Matt Van Wieringen and Mike MacLeod to undertake their final, year-end project in 2006, they and project partners Ben Fagan and Mark Bernacki were thinking green.

“We kind of wandered across the idea of a door opener,” explains Mr. Van Wieringen. “We had heard



From left, Mike MacLeod and Matt Van Wieringen, graduates of the Manufacturing Engineer program at the University of Ontario Institute of Technology (UOIT), and inventors of the automatic handicap entrance door that captures and uses its own energy. They are joined by and Dr. Mike Szarka (right), manager of UOIT's Office of Technology Transfer and Commercialization. PHOTO: SUPPLIED

about a speed bump that captures energy as the car drives over it, and we liked the idea of utilizing wasted energy.”

They were soon spending long hours in a garage, designing and building an automatic door for use as a handicapped entrance. The door operates on pneumatics, using captured energy generated through the manual opening of the door, later to be used for assisted openings. The project caught the attention of a General Motors representative during UOIT's engineering days, who advised them to patent

the product.

Mike Szarka, manager, Technology Transfer and Commercialization at UOIT, confirms a patent is indeed pending. “We are drawing a lot of attention with the door from media.... Our preferred outcome is to find an entrepreneur or company who will manufacture the door.”

Explains Mr. MacLeod, “In its current state, the door will hold about 10 automatic charges, but that is completely adjustable, depending on the application and the storage tank volume. It can also be

adapted to capture energy from revolving doors as well as regular doors. Optional features include an electrical back-up mechanism in case of emergency.”

Who knew that contributing to a greener Earth could be as simple as opening a door?

Digital Dash – paradise by the dashboard light

For those who relish those techie touches in new cars, Digital Dash feeds the craving for the latest and greatest by combining state-of-the-art,

multi-touch screen technology with conventional console knobs, buttons and sliders.

Soon drivers will be able to control when, how and where to view displays for stereo settings, heating and ventilation controls, time and weather, and video displays of GPS maps and blind-spot camera images.

Tim Pryor, a Master of Engineering Entrepreneurship and Innovation student at McMaster University, and president of Digital Dash, says, “Drivers should be able to customize the functions on their dashboard as easily as they program their cell phones. It allows for greater personal style and comfort, but also improved driving safety.”

Digital Dash technology can be curved and shaped to fit all types of irregular surface areas, is approximately 10 inches by 13 inches and designed to fit in the centre-stack area of a car without wiring or interconnects. Car and highway truck manufacturers have already shown interest in the product, and small wonder.

“One of the big challenges for manufacturers is finding space to fit all the new electronic accessories, sensors and indicators being added to vehicles,” explains Mr. Pryor. “Our technology allows for displays to be layered in terms of priority and preference. If new applications become available, the software can be downloaded. Design is limited only to the imagination of the designer.”

INFLUENCE STARTS HERE

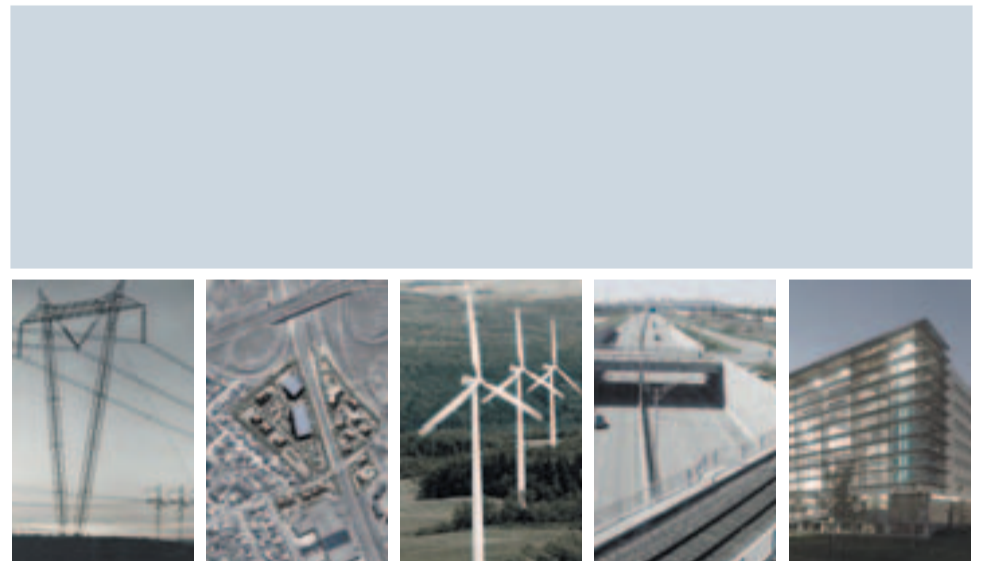
The University of Windsor congratulates Mechanical Engineering Professor, Dr. William Altenhof, winner of the 2008 Ontario Professional Engineers Award, “Young Engineer of the Year”.

Dr. Altenhof, working with the AUTO21™ Networks of Centres of Excellence Child Safety Research Program, analyzes what happens to children in automobile crashes.

Best wishes for continued success!

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Bioengineering innovations change lives

Researchers studying the use of engineering technology to improve the health and well-being of Canadians are bringing the futuristic imaginings of Star Trek to life: glasses that help the vision impaired to see, the use of electrical stimulation to restore movement to spinal cord patients, and lasers that heal.

Here is a sneak peak at a few up-and-coming bioengineering innovations that will change our lives forever.

Spinal cord patients get moving

An award-winning bioengineering technology – proven effective by Milos Popovic, Ph.D., P.Eng., and his team of engineers and clinicians – is giving stroke and spinal cord injury patients the use of their hands and arms.

“Out of a large number of spinal cord injured patients that benefited from our therapy, we had three exceptional cases where individuals were not able to grasp anything prior to treatment,” says Dr. Popovic, “but at the end, they were able to do fine motor

tasks such as needlework.”

Functional electrical stimulation was originally conceived of in the '60s as a permanent assistance device that can be worn external to the body or as an implant, but Dr. Popovic and other researchers noticed spontaneous recovery in the patients using this technology.

“We activate their muscles artificially and, after a certain number of sessions, patients start to move their arms on their own,” says Dr. Popovic.

While this therapy is still in development, many bioengineering technologies are either already in or are poised to

enter the market.

Healing at the speed of light

Theralase Inc. has collaborated with Ontario Centres of Excellence (OCE) and the University Health Network to develop a line of Low Level Laser Therapy (LLL) products that are already in use.

The lasers penetrate the skin and accelerate cell growth and reproduction, stimulate tissue repair for faster healing, reduce the formation of scar tissue, reduce swelling caused by bruising or inflammation and increase blood flow to

damaged areas – all with no physical side-effects.

Early cavity detection means less drilling

Toronto-based Quantum Dental Technologies grew out of a frustration about the reactive approach dentists must take in dealing with cavities (also known as caries).

The Canary Dental Caries Detection System – developed by dentist Stephen Abrams and University of Toronto professor Andreas Mandelis – is a safe, low-power, hand-held laser that can detect areas of tooth decay only a fraction of

a millimetre in depth.

With help from the OCE, Dr. Mandelis and Dr. Abrams were determined to remove unnecessary guesswork and make tooth decay diagnosis more accurate. This gives dentists the opportunity to halt or reverse early-stage tooth decay with re-mineralization techniques – far less invasive, expensive and painful than needles and fillings.

“OCE was the catalyst for seeing [the potential] of this idea and supporting our work to bring us to market,” says Dr. Abrams. “It’s far more than just funding, it’s

CONGRATULATIONS!

The University of Waterloo Faculty of Engineering is proud of Dr. Yeow for his exceptional achievements and for receiving a 2008 Ontario Professional Engineering Award.

Waterloo Engineering is a multi-faceted engineering school with eight academic units, home to about 250 faculty, 1400 graduate students and 5500 undergrads. Over 29,750 alumni have made their mark in industry, academe and the public sector, in Canada and around the world.



John Yeow, PhD, PEng
Waterloo Engineering
Faculty Member
OPEA 2008 Engineering Medal –
Young Engineering Award

Dr. Yeow has compiled an outstanding record of achievements in biomedical engineering throughout his short professional and academic career. His ground-breaking work in bio-MEMS has led to the development of first-of-kind micromachine-based Optical Coherence Tomography systems to improve health care through improvement in image quality, acquisition of in-vivo images with good spatial resolution and minimally invasive endoscopy procedures which help reduce patient stress. This work earned him the Douglas R. Colton Medal of Research Excellence in 2005. Dr. Yeow has been a faculty member of Waterloo's systems design engineering department since 2004.



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- :: The General Motors of Canada Automotive Centre of Excellence to open in late 2009 – a partnership with GM and the Government of Ontario that will make UOIT home to the country's premier automotive research and development centre.



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really support.”

Quantum’s innovative Canary System is set to enter the market in 2010.

High-tech glasses empower vision impaired

Another bioengineering development, which led to the creation of eSight Corp., is currently in the “proof of concept” stage. The company has developed a wearable vision enhancement device, which is essentially a pair of intelligent glasses.

Their products will significantly improve the quality of life for individuals with low

vision due to diseases such as macular degeneration, diabetic retinopathy, glaucoma and retinitis pigmentosa.

Using advanced imaging technology, eSight’s so-called “evSpex” enable the visually impaired to see better by enhancing the image presented to their eyes; compensating for blind spots, colour deficiencies, poor visual acuity and lack of contrast sensitivity.

Production models will include high-resolution displays rather than traditional lenses, and will incorporate miniature cameras in the frames. The cameras will take a full motion

video of the field of view, and – on a real-time basis – the system will manipulate the video and present it to the user’s eyes in a way that maximizes their remaining functional vision.

According to Dan Mathers, eSight’s president and CEO, “The potential for this device in the low vision and high volume consumer markets is enormous. OCE has been very supportive, and this, along with the significant support from our partners such as the Ottawa Eye Institute, has allowed us to quickly accelerate our preparation for the next phase of our market development.”

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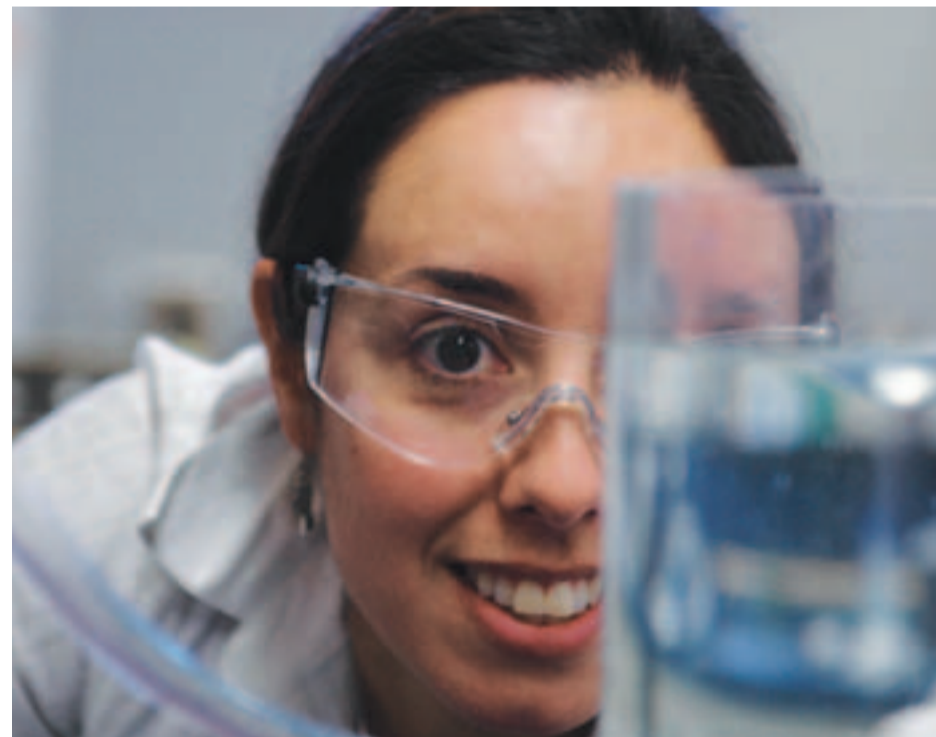
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Preparing international engineering grads for professional exam

Many international engineering professionals in Ontario end up underemployed or not working as engineers

Thankfully, Ontario does have a tradition of helping them get licensed. About one-third of Ontario's 70,000 licensed engineers were educated outside of Canada.

Now, with the Ministry of Citizenship and Immigration, the Ontario Society of Professional Engineers (OSPE) has developed a preparatory course for internationally trained engineers to prepare them for the Professional Practice Examination administered by Professional Engineers

Ontario (PEO).

Technical information; legal and ethical practices related to engineering in Ontario; and examination preparation, best approaches to case-based questions, and handling exam stress will be covered. "The course also includes some of the cultural aspects that are important to understand when people come to the Ontario-based workplace," says Angela Shama, P.Eng., OSPE's CEO.

Colin Lemoine of the Ontario Ministry of Citizenship and Immigration says the government has a history of partnering on such programs: "OSPE applied to the Ministry through an open Call for Pro-

posals process and their proposal met the criteria for funding."

Two courses will take place in January and September 2009 in Toronto.

"Comprehensive licensure is in the public interest," says Kim Allen, P.Eng., CEO and registrar of PEO. "A licence demonstrates that its holder has been rigorously educated, is experienced and is committed to a code of ethics. It also provides a means to make the holder accountable to the public."

PEO also offers the first year of its Engineering Intern Training Program to foreign engineering graduates at no cost - a \$230 savings.



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