

THE GLOBE AND MAIL THURSDAY, OCTOBER 30, 2008

2008 Ontario Professional Engineers



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

YOUNG ENGINEER AWARD

t 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 atten-



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

YOUNG ENGINEER AWARD

M ost 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



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

RESEARCH & DEVELOPMENT AWARD

A listair 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.



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

ENGINEERING EXCELLENCE AWARD

B ob 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



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

MANAGEMENT AWARD

O ver 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 benchadds.

his local Professional Engineers Ontario chapter.



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

CITIZENSHIP AWARD

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

That is what Ranee 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

M ilos 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

R obert 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.

GINEERS



Sohrab Rohani, PhD, FCIC (Fellow of Cher tute of Canada) Professor and Chair, Depa Chemical and Biochemica University of Western Ont

RESEARCH & DEVE AWARD

R esearcher, profectair of the Dechair of the Dechair of the Dechair of the Dechanical and Dechanical and Dechanical and Dechanical and Dechanical and Control.

"Industrial crystalliz lot of applications in in says. During his 35-yea worked with potash, fo ceuticals and new catal energy sector and envir protection.

He has written 89 p international conferenc referred articles for ren tific journals, as well as siderable research in te transfer.

In the past 10 years, has helped drug compabetter, more stable drug Under his leadership, h ment has become a sign in Canadian chemical e attracting \$37-million w grants in the past five y

With fascinating wo supportive environmen accessible, well-equippe ry, Dr. Rohani consider tunate. "I look forward workday as much as I o home."



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Global Leadership

University of Toronto Engineers lead the world

Congratulations to our Alumni and Faculty who's global leadership has been recognized by the PEO/OSPE.

GOLD MEDAL WALTER CURLOOK

U of T 1950 Metallurgy; 1951 MASc; 1953 PhD U of T Engineering Adjunct Professor

ENGINEERING MEDAL RESEARCH & DEVELOPMENT

MILOS POPOVIC U of T 1996 PhD U of T Engineering Associate Professor

ENGINEERING MEDAL MANAGEMENT MARK JOEL HUNDERT

U of T-1971 Industrial National Director, Hay Group Health Care Consulting

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ENGINEERING MEDAL YOUNG ENGINEERING AWARD CONSTANTINE CHRISTOPOULOS U of T Engineering Associate Professor

ENGINEERING MEDAL YOUNG ENGINEERING AWARD JOHN T. W. YEOW

U of T 1997 Electrical; 2000 MASc; 2003 PhD Assistant Professor, University of Waterloo



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ONTARIO SOCIETY OF PROFESSIONAL ENGINEERS



Professional Engineers Ontario

Bioengineering innovations change lives

R esearchers 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 (LLLT) 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