



KITCHENER-WATERLOO SECTION

September 2006

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The Kitchener-Waterloo Section of the Institute of Electrical and Electronics Engineers serves members whose mailing address is in Bruce, Grey, Perth, Waterloo or Wellington counties. It collects news relevant to local engineers and is published online bi-monthly. Contact the editor to have a printed copy mailed.

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Upcoming Events

Check <http://kw.ieee.ca/activities.html> for updated information.

Toyota Plant Tour in Cambridge

Vehicular Technology Chapter presentation
October 30, 2006, 1:15 pm

The tour will take you right into the heart of Toyota Motor Manufacturing Canada Inc to see how robots and Team Members build the Corolla, Matrix and Lexus RX330. The tour guides will communicate directly to you through an audio headset as you travel on a motorized tram into the action.

- See production and quality control systems in action
- Learn about just-in-time manufacturing

For more information, visit

<http://www.cambridgetourism.com/sub/Toyota/default.asp>

Location: Bus Stop at Davis Centre on U of W Campus

Fee: \$10

Attendance is limited - RSVP to wzhuang@uwaterloo.ca by October 12.

(The tour takes about 1 1/4 hrs plus ride from U of W to Cambridge and back)

Knowledge and Data Mining (KDM) Workshop

CIS and SMC chapters

The Pattern Analysis and Machine Intelligence (PAMI) research group will be organizing a two day workshop to be held October 30/31 at UW. The primary objectives of the

workshop will be to: advance state-of-the-art KDM, machine intelligence, computer vision and robotics; develop human resources for such high-tech R&D; and, promote technology transfer between university and industry. Currently, four spin off companies have been established by members of the PAMI group. See: <http://pami.uwaterloo.ca>

ATS Plant Tour

IEEE KW Gold Affinity

The tour at the Cambridge Systems plant will outline the process flow from Engineering to shipping. Members will have a better understanding of the teamwork involved in producing automated tooling systems. Tour will be 1 1/4hrs long. Time/date of this event is targeted for early December – details to follow.

IEEE Elections in Progress

Help set the direction of the IEEE. Vote at: <http://www.ieee.org/elections>

Electrical Power Symposium

IEEE Conference

The Ottawa IEEE Section is hosting the 6th Annual Electrical Power Symposium this year:

EPS 2006: From Tesla's AC Power System to Distributed Generation and Smart Grids
November 9 - 10, 2006 in Ottawa

Network with Power Industry Leaders and Professionals, Learn about the Latest Technological Innovations, Discover what the future holds for the Power.

Visit the conference website at: <http://www.ieee.org/EPS2006>

Call For Fellow Nominations

IEEE

Forms and instructions for preparing nominations for IEEE Fellow grade membership are now available on the IEEE web site at <http://www.ieee.org/fellows> . Nominations may be prepared electronically or in hard copy form and must be submitted by March 1, 2007.

The grade of Fellow recognizes unusual distinction in the profession and is conferred upon a person with an extraordinary record of accomplishments in any of the IEEE fields of interest. These accomplishments shall have contributed importantly to the advancement or application of engineering, science and technology, bringing the realization of significant value to society.

Call for IEEE Mentors!

IEEE is offering its members the opportunity to participate in an online program which will facilitate the matching of IEEE members for the purpose of establishing a mentoring partnership. By volunteering as a mentor, individuals use their career and life experiences to help other IEEE members in their professional development. As a mentee, you lead your partnership by selecting your mentoring partner from among those who have volunteered to serve in this capacity. We ask that you review the time and effort commitment to the program to ensure a successful mentoring partnership.

Presently, IEEE is offering potential Mentors, like you, the opportunity to enter the program first. IEEE has partnered with The Training Connection, a vendor that has developed a web-based mentoring program to facilitate the matching process. Participation in the program is voluntary and open to all IEEE members above the grade of Student Member.

If you are interested, please go to <http://www.ieee.org/mentoring> for information on the roles and responsibilities of each mentoring partner, the program, as well as additional information on time and effort commitments. To access the online program site visit the IEEE Membership Benefits page listed under Core Benefits "New for 2006" at <http://www.ieee.org/web/membership/benefits/index.html> . This will then take you to the online mentoring program site. We encourage you to take advantage of the IEEE network of technical professionals and sign up for the online mentoring program today.

If you have any questions, please contact Cathy Downer, IEEE Mentoring Program Coordinator, at c.downer@ieee.org

Green Energy Conference for Youth

UW Engineering Science Quest

ESQ is pleased to support the upcoming Green Energy Conference for Youth hosted by the Association for Bright Children (Waterloo Chapter) and the University of Waterloo.

This conference is open to students from GRADES 6-12 and will take place at the Arts Lecture Hall at the University of Waterloo on Sunday October 22, 2006 between 12 and 4pm.

Please click on the link below for the conference brochure with details, including a registration form.

http://www.esq.uwaterloo.ca/Notices/GE_Flyer_2006.pdf

Please direct conference inquiries to the coordinator for ABC, Diane McInnis: mcinnis3196@rogers.com

Time and Motion

Perimeter Institute Public Lecture by Harvey Brown, Oxford

November 1, 2006, 7:00 pm

Tickets available Monday, October 16 at 9:00am.

Newton's first law of motion - and the very meaning of inertia - has been described as either completely obvious (D'Alembert) or a "logician's nightmare" (ex-editor of the American Journal of Physics). Sometimes the simplest things in physics are the most subtle. The first law will be described in historical context, explaining a connection with the ancient Greek's distinction between natural and violent motion and with Descartes' natural philosophy. You will also learn why it still requires careful handling and what it tells us about time in physics.

Hybrid Cars Talk in Toronto

IEEE Toronto

Oct 26, 2006 at 6:00 p.m.

PEO Toronto Dufferin Chapter presents a seminar on "Hybrid Cars" co-sponsored by the IEEE Toronto Women in Engineering Affinity Group

Details: <http://toronto.ieee.ca/events/oct2606.htm>

Recent Events

Conestoga Earned Third Place in National Competition

Innovation, feasibility and practicality were what the judges sought, and what Conestoga College students Stephen Connell, Jonathan Musselman and Derek Novakowich put into their final-year comprehensive project.

At Conestoga, their efforts earned them the prestigious Conestoga College Mastercraft Award for the best technical, program-related project in the 2005-2006 academic year. On September 15, 2006, it earned them the \$2,000 third-place award in the national IEEE Canada TELUS Innovation Award competition in Toronto. In doing so, their project bested entries from institutions such as the University of Toronto, Ryerson University, the University of Alberta and Dalhousie University.

The projects could be individual or team endeavours, but needed to display an innovative approach to employing integrated computer technologies. Furthermore, the projects had to feature a strong design and/or research component with the emphasis on use of innovation that at the same time had strong potential for application in industry in the foreseeable future.

Only nine projects made the cut for the final competition, in which the competitors were required to report both verbally and in writing before a panel of industrial and academic experts and technical media representatives.

The Conestoga project is known as a DAP, or DigiPhase Acoustic Processor. It employs a remote mobile calibration module that provides quality digital sound processing for home entertainment centres, regardless of how the owner arranges the system components and furnishings in the room containing the centre. The DAP allows any system to sound at its best by automatically compensating to ensure sound quality.

At the IEEE-TELUS competition, the first prize of \$10,000 went to Scribe: A Real-Time Transcription Tool, the project submitted by Memorial University of Newfoundland. The \$5,000 second prize went to the project from the University of Saskatchewan, iHold Music on Hold Device.

National Quantum Network Launched

UW media relations office

A new national network, headquartered at UW's Institute for Quantum Computing, will ensure that research laboratories and tomorrow's workforce are populated with quantum-aware graduates. It will also provide made-in-Canada breakthroughs, protect them and promote them to private and public sectors.

QuantumWorks is an innovation platform, funded by the Natural Sciences and Engineering Research Council of Canada. Innovation platforms are special initiatives that play a role in shaping the direction of Canadian research in a targeted area of emerging scientific and economic interests.

The network will link quantum researchers from across Canada with industrial and government partners, and lead the country into the next technological revolution -- that of quantum information.

"QuantumWorks will build upon established national expertise in quantum cryptography, quantum algorithms and quantum information processing devices," said the network's scientific director, Raymond Laflamme. "Its research programs and national information training strategy will ensure that Canada benefits from the tremendous work going on right across the country."

<http://www.quantumworks.ca/>

Midnight Sun Earns Sustainable Development Award

UW Media

UW's Midnight Sun Solar Car Team has won the Yves Landry Foundation's Progress Toward Sustainable Development Award (College Or University Level) for 2006. The car and team won the Guinness World Record for longest journey by a solar electric vehicle. The award is one of five academic awards that will be presented at the foundation's awards gala on October 26 at the Westin Harbour Castle in Toronto. Each award recipient will receive \$5,000 in recognition of their innovative programs to advance technological education and skills training. It's the second year in a row that a UW student team has won this award: in 2005, the UW Alternative Fuels Team were the winners.

Engineers Develop Detector for Mad Cow, Other Prion Diseases

Guelph

Two University of Guelph engineers have received substantial research funding to continue developing a simple, inexpensive sensor for quick detection of brain-wasting infections related to mad-cow disease.

Profs. Gordon Hayward and Warren Stiver, School of Engineering, will use almost \$200,000 in federal funding to further develop a device intended to pinpoint cases of bovine spongiform encephalopathy (BSE), or mad-cow disease in cattle, and related forms of transmissible spongiform encephalopathies, or prion diseases.

Scientists believe that these fatal illnesses of the central nervous system are caused by proteins called prions that convert normal proteins into an infectious form. The incurable

diseases, including variant Creutzfeldt-Jakob disease in humans, cause sponge-like holes to develop in brain and nervous tissue.

The U of G engineers have developed an acoustic prion sensor whose quartz crystal detects the telltale misfolding of prion proteins from samples of nerve tissues, bodily fluids and environmental samples.

Working with scientists at the National Reference Laboratory of the Canadian Food Inspection Agency in Ottawa, Hayward and Stiver have shown that their device can distinguish between normal samples and brain tissue of sheep infected with scrapie and deer with chronic wasting disease.

The sensor provides results in about two hours, at least as fast as conventional tests using antibodies. A convenient, rapid assay to pinpoint infected individuals could avoid the need to cull entire herds of cattle suspected to have BSE.

Nuclear firm funds hydrogen study

UW Media

Bruce Power -- the company that operates two nuclear generating stations beside Lake Huron northwest of Waterloo -- has announced a \$75,000 "partnership" with UW researchers to study the commercialization of hydrogen, "the fuel of the future".

The company said it will establish the Bruce Power Hydrogen Economy Development Study, which will begin in January and will see graduate students at UW "analyze a wide array of key technical and policy areas required to move Ontario's hydrogen economy forward".

The Canadian Hydrogen Association and The Hydrogen Village "have also joined as strategic partners of the new program", Bruce said. "It is our view that hydrogen will be the fuel of the future, and it makes perfect sense that some of our future leaders will help its development," said Duncan Hawthorne, Bruce Power's president. "By working closely with the University of Waterloo, I believe we can take a leadership role in understanding the many complex issues surrounding hydrogen commercialization and move forward together."

The company said the first area of focus will be examining off-peak hydrogen production from nuclear power and distributive electricity generation. "The company will now work with UW to secure additional funding from business, labour and government while the scope and size of the program is finalized over the next several months."

The key person at UW is Michael Fowler, a faculty member in chemical engineering who will co-ordinate a number of faculty members to supervise students during their hydrogen economy research. "Waterloo is excited that Bruce Power has taken the lead to launch such a breakthrough initiative," Fowler said. "Developing Ontario's hydrogen economy will require strategic investments to ensure we create the capability to move this sector

forward. Clean hydrogen technology and clean nuclear power are a powerful combination for addressing our air quality and climate change issues."

He said he anticipates that the hydrogen program will [involve] the environmental studies faculty and the electrical and computer engineering department as well as chem eng.

<http://www.brucepower.com/>

Engineers and the World

Sewage Generates Electricity

KW Record

Hamilton is the first city in Ontario with a deal to sell electricity generated from a sewage treatment plant. As bacteria digest the sewage solids, they release gas used to fuel an engine, which spins a generator that produces enough power for about 1500 homes.

What do you mean by Vegetarian?

Tom East

In 1997, I attended a large international conference on Solar Powered Satellites at a five star hotel in Montreal. At the banquet, I was sitting next to a scientist who had flown in from India, to present an award to someone.

On the application form, you are asked whether you will be attending the banquet, and whether you want meat, fish or "other". The man from India had evidently written "vegetarian". When he checked in at the conference, he was asked "What do you mean by vegetarian?" He had replied "anything made of vegetables and rice will do".

At the banquet, while I was being served beef and mashed potatoes, he was given a finger salad of raw carrots and celery, and a bowl of rice pudding. For this he had paid \$35.00.