



KITCHENER-WATERLOO SECTION

January 2007

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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.

Engineering Milestones, past and future

IEEE Annual General Meeting, Feb 15, 7pm UW Davis Centre DC1302

Our Distinguished speaker will be Wally Read, IEEE President in 1996. Now IEEE is the worlds largest engineering professional society with 370,000 members in 150 countries. Our evenings theme will be ‘Engineering Milestones, past and future’. Joining him will be Tom East, KW’s own IEEE Life Member. Tom will speak to what KW & Peterborough Section will be doing in joining Boston Section in planning an IEEE Milestone for Reginald Fessenden. The Milestone is for the ‘First Audio Broadcast’, the first use of amplitude modulation of continuous electromagnetic waves to transmit to may receivers (1906) – the precursor to radio and television broadcasts.

ATS Plant Tour

IEEE

A plant tour is being planned but details are not available yet.

Fundamental Physics in 2010

Perimeter Institute Public Lecture, February 7, 2007, 7:00 pm

Will big questions be answered when the Large Hadron Collider (LHC) switches on in 2007? What will scientists find? Where might the research lead? Nima Arkani-Hamed, a noted particle theorist, is a Professor of Physics at Harvard University. He investigates a number of mysteries and interactions in nature – puzzles that are likely to have experimental consequences in the next few years via particle accelerators, like the LHC, as well as cosmological observations.

Life, the Universe, and the Search for Extraterrestrial Intelligence

Perimeter Institute Public Lecture, March 7, 2007, 7:00 pm

Hollywood movies about aliens abound, but do they really exist? The real scientific search for evidence of life, and particularly intelligent life, elsewhere in the cosmos is just as exciting as the “reel” version, and a lot more logical. So far, there is ‘life-as-we-know-it’ to guide our speculations and observations. But a new appreciation for the tenacity of life, a growing respect for the world of microbes, and new search technologies involving observatories and spacecraft are rapidly expanding our viewpoint. Many expect surprises. SETI is at the forefront of this research and has plans to extend its range out even further into the galaxy, looking for evidence of someone else’s technology. In the next few decades, scientists will take a much closer look at places within our solar system where liquid water (even vast oceans) may exist and harbor life. They will also probe the closest stars to see if other ‘Earths’ and biospheres exist. Dr. Jill Tarter will describe research in a discipline some call “the archaeology of the future”.

Robotics event returns in March

UW media relations office

UW is inviting high school mech-heads from across southwestern Ontario to participate in the first round of an international competition in robotics.

The FIRST Robotics Competition challenges teams of high-school students and their mentors from around the world to solve a common problem in a six-week period using a standard parts kit and common set of rules. Teams build robots from the parts to play a game where the objective is to score points by completing such tasks as shooting balls, stacking boxes, climbing over obstacles or hanging from bars.

The competition, to be held March 22-24, will be open to the public, and admission is free.

<http://www.firstroboticscanada.org/site/aboutfrc>

Recent Events

3D Human Ear Recognition

IEEE seminar by Professor Bir Bhanu, University of California, Riverside, California

Ear is new class of biometrics that has certain advantages over face and fingerprint which are the two most common biometrics in both academic research and industrial applications. An ear can be imaged in 3D and surface shape information related to its anatomical structure can be obtained. This makes it possible to develop a robust 3D ear biometrics. The talk will present complete human recognition systems based on 3D ear biometrics. It will explore various aspects of 3D ear recognition: representation, detection, recognition, indexing and performance prediction. The experimental results on various large datasets will be presented to demonstrate the effectiveness of the algorithms.

ECE Symposium

UW Daily Bulletin

The symposium allows students to demonstrate an intensive design project which challenges them in their final year of study to work in groups to identify and address specific design problems. This year's projects included:

Voice-Controlled Personal Music Device. The project develops a prototype voice-controlled system allowing users to communicate with personal music devices, such as an iPod, without operating a keypad-based control interface. The application receives input commands through the microphone, using a voice recognition engine to decode the verbal data. The prototype provides an alternative method of operation for personal music devices by increasing their usability as well as making them more available for people with physical impairments.

Wireless Remote Access Pacemaker. Pacemakers are implanted inside the bodies of patients with cardiac conditions to monitor and facilitate heart functions. The project presents the design of a wireless interface for the pacemaker to communicate to a wireless-capable external device, such as a personal digital assistant. The design, when integrated with a network infrastructure, will enable real-time streaming of vital health information from the patient's pacemaker to a monitoring agency.

Efficient Driveway Snow Melting System. The project offers a convenient alternative to the task of shoveling snow. A network of resistive coils is used to melt snow accumulated during a storm. To conserve excessive energy usually consumed in the winter months, the snow melting system will use a combination of alternating current and solar energy. It will also automatically activate and deactivate according to environmental conditions.

Nobel physicist joins UW faculty

UW media relations office

A winner of the 2003 Nobel Prize for Physics will bring his considerable talents and knowledge north in what can only be considered a brain gain. Sir Anthony J. Leggett has accepted a faculty position at UW: the newly created position of Mike and Ophelia Lazaridis Distinguished Research Chair.

Leggett is widely recognized as a world leader in the theory of low-temperature physics. His pioneering work on superfluidity earned him and two colleagues the 2003 Nobel Prize in Physics.

Leggett will advise on promising research directions, help younger scholars develop their research programs and share his knowledge with the general public. His specific duties include supervising UW graduate students here and on the campus of the University of Illinois at Urbana-Champaign, where he has been a faculty member since 1983; offering seminars to undergraduate and graduate students; delivering public lectures; mentoring newly recruited professors; and guiding research direction as a member of IQC's scientific advisory committee.

Canadian Undergraduate Technology Conference

UW Media services

"This 3-day conference," a news release says, "brings together students from across Canada with academia and industry leaders from across the world. CUTC is Canada's largest undergraduate technology conference with over 650 delegates and participants from companies such as Microsoft, Research in Motion, Apple, ATI, Telus, Bell and many others. Throughout the event students participate in 5 major keynote sessions given by professors and company leaders, as well as attend seminars on the most recent innovations in technology. They also take part in activities that provide hands-on experience for solving real-world problems through decision making in both the technical and business aspects of technology.

"What makes CUTC a unique event compared to other conferences is its special events. The most renowned event is TechExpo, an exhibition of the latest technology with company representatives present to talk to students and answer questions. This event is favoured both by students and companies as it displays technology present in research labs and on the market, while providing great business networking opportunities. Other special events include TechShow (a talk-show event set up to interview industry leaders, while giving out prizes and playing games), TechTours (tours of specific company facilities in the area), and TechShops (design workshops).

"This year's conference will see the inauguration of TechTeam, a design competition based on real-world issues. The issues are presented as case studies by select companies on the first day of the conference, and the students taking part will have 3 days to come up with a design solution. The select companies will award the best two designs for each topic (four topics in total) at the closing banquet."

Infusion Angels Innovation Centre

Waterloo Tech Digest

Infusion Development, the New York-based company which announced in May that it was opening a Waterloo-based incubator called Infusion Angels. Not long after the launch, the incubator concept was repackaged into a proposed Microsoft Innovation Centre that would open in Waterloo with the support of Infusion and showcase Vista, .NET and other new technologies. In the last few weeks, that has changed again -- slightly -- and the proposed site is now being called the Infusion Angels Innovation Centre.

Engineers and the World

Low-Cost Rural Internet Kiosks

UW media services, part of CUTC article

Srinivasan Keshav of the school of computer science. Keshav described a project in which he's involved: "We have developed a robust system to provide Internet access to rural kiosks. It is based on two ideas. First, each kiosk has a small, cheap, tamper-resistant 'kiosk controller' that manages one or more refurbished PCs. Second, kiosk controllers exchange data with the Internet by wireless communication with similar single-board

computers carried on vehicles such as buses, cars, and trucks. Vehicles opportunistically pick up messages from kiosks, carry them on board, and drop them off at gateways, where they enter the Internet. Our system is low-cost and economically viable. We estimate that our system requires a capex of \$100 to \$700/kiosk, depending on the configuration, and an opex of \$75/kiosk/month, including the cost of field technicians and capital depreciation. This is four to ten times cheaper than other solutions. Our system is rapidly deployable: we successfully installed a prototype in Anandapuram village, Vishakapatnam district, AP, in two days during May 2006."

Mass Production of Custom Components

KW Record

Local hearing aid manufacturer, Siemens, is using stereolithography to produce hearing aid shells that are custom made for an individual's ear. The technology uses a laser to harden a resin in thin layers.

Math grad brings intellectual entertainment to the masses

UW Media

On event night you'll find Jonathan Ezer (BMath '00), at Toronto's Jamie Kennedy Gardiner, the ultra-hip restaurant on the third floor of the Gardiner Museum, watching a room full of people seat themselves in anticipation of two hours of intellectual entertainment. At least that is what Jonathan hopes will happen if he has done a good job spreading the word about his new, inspired endeavour: Salon Voltaire.

Jonathan created Salon Voltaire as a biweekly lecture series, pairing academic speakers on wildly diverse topics, echoing a modern-day intellectual salon. The plan, he says, is to "facilitate an evening where sophisticated people come together to discuss art, politics and ideas that can change the world."

By partnering with Toronto's golden-boy chef, Jamie Kennedy, he draws mature audiences with a hunger for smart discussion and an appetite for fine food and cool ambiance. This differs from other lecture series because the high-end venue allows for high expectations of food and company, the lectures consistently happen every other Friday all year long, and the audience is transformed into active participants while watching a live show.

Rest of the article:

http://alumni.uwaterloo.ca/alumni/e-newsletter/2006/december/jonathan_ezer.html

Website: <http://www.salon-voltaire.com/>