



## KITCHENER-WATERLOO SECTION

September 2011

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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 monthly.

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<http://kw.ieee.ca>

IEEE KW Section, c/o Electrical & Computer Engineering (EIT 3028)

University of Waterloo

Waterloo, ON, N2L 3G1

## KW Section Executives

<http://www.ieeekw.com/executive.php>

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Vacant

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Student Activities (Conestoga College)

Student Activities (University of Guelph)

Student Activities (University of Waterloo)

Educational Activities

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Awards

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Information Theory (IT12)

Photonics (PHO36)

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WIE (Women In Engineering)

Consultants Network

LM (Life Members)

Vacant

Dr. Ladan Tahvildari

Dr. Shahab Ardalan

Vacant

### Student Branches :

Conestoga College Student Branch

University of Guelph Student Branch

University of Waterloo Student Branch - Stream A

University of Waterloo Student Branch - Stream B

Mr. Justin Swance

Vacant

Mr. Haosen Cai

Ms. Joanna Ma

## Vacant Positions

The IEEE Kitchener-Waterloo Section is looking for interested volunteers to fill a number of available positions on the board. Anyone interested should contact one of the executive for further details.

<http://www.ieeekw.com/executive.php>

## Upcoming Events

Updated information can be found at <http://www.ieeekw.com/activities.php>.

## IEEE IAS PCIC Technical Conference

September 19 – 21, 2011  
Toronto, ON

The Petroleum and Chemical Industry Committee (PCIC) of the Industry Applications Society of IEEE invites you to attend its 58th annual conference in Toronto. The 2011 conference is scheduled for September 19-21, 2011. The Conference Tutorials will be held on September 22.

Under the sponsorship of the Industry Applications Society, the PCIC Conference has become the premier annual application meeting for practicing electrical engineers. Following conferences in Calgary, Cincinnati, Anaheim and San Antonio the Committee is planning an equally outstanding event for 2011.

The conference is noted for the high quality and practical application of its technical papers. The technical program this year will continue to feature papers focusing on the technology and issues faced by electrical engineers in the petroleum and chemical industry.

[http://www.ieee-pcic.org/Conferences/2011\\_Toronto/index.html](http://www.ieee-pcic.org/Conferences/2011_Toronto/index.html)

## Miniaturization of Ultra-Wideband Antennas

September 12, 2011  
University of Toronto, ON  
IEEE Electromagnetics & Radiation Toronto Chapter

Speaker:  
Dr. Zhi Ning Chen

Ultra-wideband (UWB) has become the promising wireless technology in commercial applications such as next-generation short-range high-data-rate wireless communications, high resolution imaging, and high accuracy radar. The antenna is one of the key designs in UWB wireless systems. This talk starts with the updates of applications of UWB technology in market followed by a brief introduction to design challenges state-of-the-art solutions of UWB antennas. Next, miniaturization technologies for UWB antennas are addressed. Planar designs are highlighted due to their unique merits and wide adoption in practical applications. First, a newly developed technique to achieve ground-independent UWB antenna performance, one of the most challenging issues in small antenna design, is addressed. A design example is used to elaborate the mechanism of the method. Based on this concept, an antenna with further reduced size is designed to fit wireless USB dongles.

Furthermore, an innovative compact diversity UWB antenna shows the advantage of ground-independence for small antennas in diversity applications. Last, UWB antennas co-designed with filtering performance using filters integrated into the antenna are proposed to reduce the overall size of devices and enhance antenna performance. At the end, the trends of UWB antenna R&D are discussed, correlated with applications and market demands.

<http://ewh.ieee.org/r7/toronto/events/sep1211.htm>

## An Overview of Regenerative Medicine Commercialization in Canada

October 5, 2011

Toronto, ON

IEEE EMBS Toronto Section

Speaker:

Dr. Rahul Sarugaser

Manager, Commercialization

Centre for Commercialization of Regenerative Medicine

CCRM ([ccrm.ca](http://ccrm.ca)) is a public-private partnership between industry, academia and the Canadian Centres of Excellence for Commercialization of Research. Its mission is to create a global nexus for regenerative medicine commercialization by unifying dynamic business leadership with high value stem cell technologies. This overview talk will present the regenerative medicine commercialization in Canada.

<http://ewh.ieee.org/r7/toronto/events/oct0511.htm>

## Practical Approaches to Signal Integrity Measurements

September 27, 2011

Mississauga, ON

This seminar is an advanced technical course on signal integrity measurements and troubleshooting techniques aimed at designers of high speed circuits. Designers using DDR 2/3, PCIe Gen 2 and 3 or 6G and 12G SAS or other high speed circuits will benefit. Specific attention will be paid to Jitter and Timing measurements with references to Compliance testing, decoding and debugging in these environments. Fixture de-embedding, channel emulation and emulation will be discussed.

The Presenter is Mike Hertz of LeCroy. Mike is an expert on Oscilloscopes, holds several patents on measurement techniques and writes extensively for the technical press.

Registration is required.

<http://ewh.ieee.org/r7/hamilton/y2011/2011events.htm#a20110927>

## IEEE Women In Engineering CSTAR Tour Event

September 29, 2011

12:00 PM – 1:30 PM

London, ON

The IEEE London Section WIE Affinity Group will be hosting a CSTAR lab tour. Registration is required.

[http://meetings.vtools.ieee.org/meeting\\_view/list\\_meeting/8131](http://meetings.vtools.ieee.org/meeting_view/list_meeting/8131)

## Toronto Aerospace Museum Lecture and Tour

October 13, 2011

Toronto, ON

IEEE Aerospace Electronics System Society (AESS)

Speaker:

Hassan Kojori

More Electric Aircraft

Join your fellow AESS members and:

- Hear a historic overview of the site
- Visit the historic "home" - an original de Havilland Aircraft of Canada manufacturing plant, where 1500 Tiger Moths were built and the famous Chipmunk and Beaver aircraft were born.
- Stand on the spot where Canada's first satellite, Alouette I, was made
- View historic aircraft displays, engines, and in-progress restorations
- Explore the role of the Defence and Civil Institute for Environmental Medicine in helping pilots, divers, and astronauts survive in their unfriendly environments.
- See the restoration of Lancaster FM 104 in progress as we tour
- See the full-size, all metal replica of the Avro Arrow

Registration is required.

<http://ewh.ieee.org/r7/toronto/events/oct1311.htm>

## EPTECH High-Tech Electronics Fall Show

October 20, 2011

Mississauga, ON

EPTECH regional professional electronics shows are produced in major high-technology centers across Canada.

EPTECH is the only series of coast-to-coast national electronics shows in Canada. The series is sponsored by EP&T, Canada's largest professional electronics trade publication, and is produced by Business Information Group, a leading technology and information provider.

Employing a highly time-efficient table-top display format, EPTECH shows target electronics designers, engineers, technicians, technologists, purchasers, technical managers and researchers.

EPTECH exhibitors cover a very broad spectrum within the electronics industry, displaying such products as semiconductors and ICs; passive and electromechanical components; test equipment and electronic instrumentation; connectors; design,

test and technical software; technical computer systems and products; design, testing and contract manufacturing services; electronic chemicals and materials production equipment; and industrial electronics products.

<http://www.ept.ca/eptech/>

## IEEE International Conference on Communications

June 10 – 15, 2012  
Ottawa, ON

Since 1965 the IEEE International Conference on Communications has been one of the flagship conferences of the IEEE Communications Society. IEEE ICC brings together the world's leaders, scientists, policy makers from industry and academia. The IEEE Ottawa Section is proud to host IEEE ICC 2012 Conference and Exhibition from 10-15 June 2012 where recent advances in the field of communications will be presented.

The theme of the conference is "CONNECT o COMMUNICATE o COLLABORATE". For participants it promises to stimulate the scientific exchange of ideas, the identification of future trends in communications, and the illumination of business opportunities. The conference program will feature 12 technical symposia, 16 industrial forums, keynote presentations, several workshops, and tutorials.

<http://www.ieee-icc.org/2012>

## Recent Events

### UWaterloo@Toronto Backs Cancer Technology

By Janet Janes, office of research  
University of Waterloo News Bulletin  
September 1, 2011

Kenneth Pritzker has dedicated his career to diagnosing disease. As a scientist himself, he's embraced the research that has uncovered new information about how disease occurs as well as new knowledge about how to manage it. But the former chief pathologist at Mount Sinai Hospital and now chief executive officer of Rna Diagnostics Inc. is taking a business approach to getting a medical technology more quickly and efficiently to the people who need it most. And he's turned to the University of Waterloo to help him do so.

Attracted to Waterloo's reputation in technology transfer, Pritzker and his new company, Rna Diagnostics, collaborated with UWaterloo@Toronto, an entrepreneurial team based in the Atrium on Bay complex in downtown Toronto and supported by Waterloo's Office of Research.

"Once we got there, our hunch was right. It was a good thing to relocate," Pritzker says. "We were actively looking for an arrangement that would be synergistic."

One of the team's first successes was to work through the Waterloo Commercialization Office to develop a collaborative agreement, which impressed

Pritzker because it was created in less than 48 hours. "They had the capacity to understand our needs. It was really amazing; ordinarily things take much longer."

Just a year later, Rna Diagnostics is developing a test called RNA Disruption Assay (RDA) that can determine whether breast cancer chemotherapy is working, offering significant cost savings to health care, but most importantly, ensuring the most effective and efficient treatment for cancer patients when time is critical. RDA was developed after Pritzker's colleague, Amadeo Parissenti, discovered during a clinical trial that a disruption in a patient's RNA molecules can lead to a better response to chemotherapy. The UWaterloo@Toronto team helped find the Waterloo scientist most suited to assist in refining the RDA technology to meet patient needs. UWaterloo@Toronto staff are working with Rna Diagnostics through the commercialization process, creating new connections, and opening doors to new funding and commercialization opportunities.

Since then, Rna Diagnostics has won first place in the TiEQuest 2011 Business Venture competition, as well as Best Healthcare Company and co-winner for Best Intellectual Property through TiEQuest. The company is continuing to enhance the test with scientists at Waterloo.

Looking forward, Pritzker sees the potential for using this technology initially for women with breast cancer, then for other cancer patients. "When they learn of it, they would want to have it right now. And we want to get it to them right now, so we're trying to get it out as fast as we can," he says.

"Our relationship with UWaterloo@Toronto is accelerating our commercialization process. We look at this as the start of a synergistic research collaboration with Waterloo," says Pritzker.

<http://www.rnadiagnostics.com/>  
<http://www.toronto.uwaterloo.ca/index.htm>

## Siggraph 2011

University of Waterloo News Bulletin  
August 12, 2011

Siggraph, the big annual International Conference on Computer Graphics and Interactive Techniques, ran in Vancouver, and Waterloo Region had a considerable presence, organized by the Canada's Technology Triangle business promotion group.

"Waterloo Region has a great story to tell, and Siggraph is the right place to tell it," says Karen Gallant, formerly of the university and now of Communitel. Among the participants in the CTT booth in Vancouver was Waterloo's Games Institute.

<http://siggraph.ca/>  
<http://www.bulletin.uwaterloo.ca/2010/nov/15mo.html>

## Top Scholarships for Graduate Students

University of Waterloo News Bulletin  
August 4, 2011

Five Waterloo graduate students have received Vanier Canada Graduate Scholarships, prestigious awards that recognize top academic achievement and leadership skills.

The national awards, announced during a ceremony at McMaster University yesterday, celebrate scholarly accomplishment in the social sciences and humanities, natural sciences and engineering, and health fields. The awards are valued at \$50,000 annually for up to three years.

Among the students is Ryan Henry, who is beginning his PhD in computer science, supervised by professor Ian Goldberg, in the Centre for Applied Cryptographic Research. The research is vital to maintain the security and integrity of data in an era where electronic data can be readily transmitted and intercepted. Henry has already published a paper at the 10th Privacy Enhancing Technology Symposium, and has four other technical reports in preparation. He serves as a mentor for new graduate students in the David R. Cheriton School of Computer Science. As an undergraduate student, Henry led several research initiatives at a custom software company in Manitoba.

## Engineers and the World

### University and Company Research Partnerships Get Federal Funding

By Rose Simone, Waterloo Record  
August 9, 2011

Drivers never give much thought to poles that support the traffic signals and lighting on the road. A pole, after all, is a mundane piece of metal.

But not to everybody. When Duane Cronin, an associate professor at the University of Waterloo recently spotted a dented pole, one that had recently been damaged by a car, he got tremendously excited.

Pretty soon, he was on the phone, arranging to have the pole delivered to his laboratory, where it now sits, hooked up to machines.

His lab at the University of Waterloo is working with Polefab Inc., a Newmarket company that manufactures sectional steel poles and products, to make them safer and more stable in accidents.

It is one of 16 University of Waterloo research projects sharing \$750,000 in funding from the Federal Economic Development Agency for Southern Ontario for research being done in partnerships with companies in Ontario.

"The purpose is to encourage collaboration between researchers and small and medium sized businesses, to help fuel their innovation and get new products to the market faster, said Waterloo MP Peter Braid, who announced the funding from FedDev's applied research and commercialization initiative on Tuesday.

"As companies are more successful at getting products to the market quicker, they increase their sales and are able to hire," Braid said.



George Arnold, president of Polefab, said for a small company like his, the funding “allows us to access to the great minds and facilities we could never otherwise have.” Cronin said in his lab, the money will help employ an engineering graduate in doing research into how well the poles perform in crash simulations and ultimately lead to different material combinations and design changes to make them safer.

The other 15 companies partnering with the university researchers are:

- Ag Energy Co-operative Ltd. and Deep Blue NRG Inc. of Guelph, to turn agricultural biomass into syngas;
- Agfa Healthcare Inc. Canada in Waterloo, to improve digital information systems used in hospitals and medical institutions;
- Avenir Medical of Waterloo, to improve surgical outcomes in hip replacement surgeries;
- CedarLane of Burlington, to research new products for fish aquaculture;
- Clearpath Robotics of Waterloo; to research control of unmanned vehicles;
- Icyne of Mississauga, to research advanced fire retardant foam insulations;
- Integran Technologies Inc. of Toronto, to research nano-metal coatings to reduce breakage of composite hockey sticks;
- Microbonds of Markham, to research lower cost and environmentally friendly insulated bonding wire technology;
- Natrix Separations Inc. of Burlington, to improve chromatography products used in separation of mixtures in life science, pharmaceuticals and beverage markets;
- NewMan Media Inc. of Rockcliffe, to create mobile applications for traditional theatre productions;
- Oakville Stamping and Bending of Oakville, to develop a flexible parts handing system to improve production;
- Sober Steering Sensors Inc. of Waterloo, to improve steering wheel transdermal technology that could replace car breathalyzer systems;
- Teledyne Dalsa Inc. of Waterloo, for new imaging technologies for use in CCD sensors and cameras;
- Thesis Chemistry Inc. of Cambridge, to work on biorefinement processes for green chemicals; and
- Tyco Electronics Canada of Guelph, to develop new printed circuit board assembly systems for ambient lighting in cars.

<http://www.therecord.com/news/business/article/576017--university-and-company-research-partnerships-get-federal-funding>

## PhD Student Wins Technology Transfer Award

Waterloo ECE News  
August 8, 2011

Mohammad Bozchalui, an electrical and computer engineering doctoral student, was recently honoured as the winner of MPrime’s award for Best Novel Use of Mathematics in Technology Transfer. MPrime, Canada’s only Network of Centres of Excellence for the mathematical sciences, brings together academia, industry and the public sector to develop mathematical tools vital to the knowledge-based economy. Bozchalui received his award at the seventh International Congress on Industrial and Applied Mathematics, which was held in Vancouver.

For Fun...

## Brain Teaser

by Kevin J. Lin, The Grey Labyrinth

There were once three men who were in competition for the hand of a young woman. So they decided to have a three-person duel to see which of them would have to marry her.

Alex was the least competent of the three duelists, hitting his target only 30% of the time. Chris was quite a bit better, hitting his target 50% of the time. And Bob was the best of all, never missing a shot.

To compensate for the obvious inequities in their marksmanship skills, they would fire in turns, beginning with Alex, followed by Bob and then Chris. The cycle would repeat until there was but one man standing (with breaks to reload if necessary).

Assuming each knew the others' ability and used the optimum strategy, who has the best chance of surviving, and what were his odds?