

# IEEE Canadian Review

La revue canadienne de l'IEEE

Winter / Hiver 2016 | No. 77

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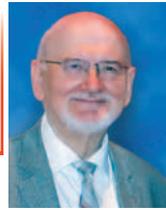
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**Witold Kinsner**

PhD, PEng, FEIC, FEC



**2016-2017  
IEEE Canada President and  
Region 7 Director**

**W**arm greetings and best wishes to all IEEE Canada members, volunteers, and activists, both young and seasoned!

In the 2016 Spring and Fall issues of the *IEEE Canadian Review (ICR)*, I described our mission, core values, challenges, and priorities, followed by some of the technical and social initiatives to solve the challenges, including big data, Internet of Things (IoT), rebooting computing, digital senses, cybersecurity, green information and communications technology, and smart cities.

I have commented that IEEE has evolved from a fairly homogeneous organization to very complex in terms of the diversity of its members, geographical membership distribution, continuous development of new paradigms and technologies, and reaching the limits of older technologies. In this new world, the next generation of highly-knowledgeable professionals may have to work collaboratively not only with colleagues in their disciplines, but also with colleagues in many related disciplines and the corresponding public and private sectors. They may have to be solving not only technical problems at hand, but also anticipate related external problems such as public policies and regulatory decisions. Another factor that must be considered is the growing mobile workforce (now more than one third of the global workforce). How will IEEE Canada prepare for these challenges?

In the future issues of *ICR*, we will be reporting on the progress and results IEEE is making in these new initiatives, and how we can play an increasing role in them.

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**S**alutations chaleureuses et meilleurs vœux à tous les membres, bénévoles et militants d'IEEE Canada, jeunes ou expérimentés!

Dans les précédents numéros de printemps et d'automne 2016 de la *Revue canadienne de l'IEEE (RCI)*, j'ai décrit notre mission, nos valeurs fondamentales, nos défis et nos priorités, et mentionné certaines initiatives techniques et sociales visant à relever divers défis : métadonnées, Internet des objets, réamorçage des systèmes informatiques, sens numériques, cybersécurité, TIC vertes et villes intelligentes.

J'ai commenté le fait que l'IEEE soit passée d'une organisation assez homogène à une autre très complexe par la diversité de ses membres, leur distribution géographique, l'arrivée continue de nouveaux paradigmes et technologies, et l'atteinte des limites des vieilles technologies. Dans ce nouveau monde, la prochaine génération de professionnels très compétents pourrait devoir travailler en collaboration non seulement avec les collègues de leurs disciplines, mais également avec ceux de nombreuses disciplines connexes ainsi qu'avec les parties prenantes publiques et privées de leurs projets. En plus de résoudre les problèmes techniques internes actuels, ils pourraient devoir anticiper des problèmes externes connexes de l'ordre des politiques publiques et des décisions réglementaires. Un autre facteur à considérer est l'importance croissante de la main-d'œuvre mobile (qui représente maintenant plus du tiers de la main-d'œuvre mondiale). Comment l'IEEE se préparera-t-elle pour relever ces défis?

Dans les prochains numéros de la *RCI*, nous ferons part des progrès accomplis et des résultats obtenus par l'IEEE dans le cadre de ces nouvelles initiatives, de même que nous décrirons la manière dont nous pouvons jouer un rôle croissant à cet égard.

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**Siksika  
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– The future is looking up

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In this ICR Winter issue, I would like to summarize on a set of our annual IEEE activities, including IEEE MGA and BoD, IEEE Canada, external relations, IEEE industrial outreach, inter-regional collaboration, pre-college and pre-university outreach, as well as some new initiatives.

First however, I have two important announcements to make. In 2016, Region 7 (R7) had these appointments: Dave Kemp was appointed to the IEEE History Committee and Alfredo L. Herrera was appointed to the IEEE Humanitarian Activities Committee. In November 2015, I was inducted to Eta Kappa Nu, Honour Society of IEEE (IEEE-HKN) with 25 other IEEE volunteers.

## 1. IEEE MGA and BoD

The IEEE Board of Directors (BoD) met five times for two days each in St. Thomas, US Virgin Islands (January 7-10, 2016), San Diego (February 10-16, 2016), New Brunswick, NJ (June 16-20, 2016), Singapore (August 27-September 2, 2016), and New Brunswick, NJ (November 16-21, 2016), while the Member and Geographic Activities (MGA) Board preceded the BoD except for the first and fourth meetings. The MGA and BoD meetings are further preceded by meetings of the Technical Activities Board (TAB) and Educational Activities Board (EAB) whose committees also meet over one or two days.

The meetings are very busy with reporting from all the boards, operational units, committees, and administration, followed by decisions regarding current and future actions. The Singapore meeting was also related to the Industry Outreach initiative.

I have participated in (i) the online training of new IEEE directors; (ii) the BoD and MGA Leadership orientation; (iii) discussions of several committees such as Collaboratec, Big Data Initiative, Internet of Things (IoT), Volunteer Leadership Training (VOLT), Region Vitality, and Smart Cities; (iv) MGA Directors Forum and MGA Board meetings, as well as (v) the BoD meetings. Our R7 Director-Elect, Maike Luiken, also attended the latter three meetings.

I also attended a Plenary Session entitled "Brain Fuel: Visualizing the Technical Communities of Tomorrow," addressing some perspectives on what the future holds for technical communities. The session moderated by Susan Hassler, Editor-in-Chief of *IEEE Spectrum* Magazine, included panelists Vanessa DiMauro, CEO and Chief Digital Officer of Leader Networks, Rob "CmdrTaco" Malda, Creator of Slashdot, and Lindsey Pollak, New York Times Best-Selling Author and Millennial Workplace Expert.

I participated in the Board and Management Council strategy session, St. Thomas, US Virgin Islands. The focus was: "What must we do now and over the next two years to capitalize on existing or emerging opportunities in our external environment,

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Dans ce numéro d'hiver de la RCI, j'aimerais résumer les activités annuelles de l'IEEE, y compris celles du bureau des activités géographiques des membres de l'IEEE (MGA), du conseil d'administration (CA) et d'IEEE Canada, les relations externes et le rayonnement industriel de l'IEEE, la collaboration entre régions, le rayonnement auprès des étudiants du secondaire et du collégial ainsi que certaines nouvelles initiatives.

Toutefois, j'ai d'abord deux annonces importantes à faire. En 2016, la R7 a procédé à deux nominations: Dave Kemp s'est vu confier le comité d'histoire de l'IEEE et Alfredo L. Herrera le comité des activités humanitaires de l'IEEE. En novembre 2015, je me suis joint à l'IEEE-Eta Kappa Nu, la société d'honneur de l'IEEE (IEEE-HKN) parmi 25 autres bénévoles.



*Dave Kemp, IEEE Canada President, 1998-1999 (centre), holds a letter from Honourable Harjit Sajjan, Minister of National Defence commending IEEE Canada's efforts in establishing a Great Canadian Profiles plaque in Honour of General A.G.L. McNaughton in Ottawa's Beechwood Cemetery. The dedication ceremony took place on October 16, 2016. Mr. Kemp was appointed member of the 2016 IEEE History Committee.*

*At far left: Dr. Witold Kinsner, President of IEEE Canada; Honourable Andrew Leslie, MP for Orléans, former Canadian Forces Lieutenant-General and grandson of A.G.L. McNaughton. Moving right from Mr. Kemp: Janet Davis, IEEE Ottawa Section Chair; Raed Abdullah, IEEE Ottawa Section Chair 2009-2010.*



*At far left, Alfredo Herrera, current IEEE Canada and Ottawa Section Humanitarian Initiatives Committees Chair, who was appointed as member of the IEEE Humanitarian Activities Committee for 2016.*

*Mr. Herrera is shown here with some of the organizers and participants of the STRAT 24 – Take Two Case History competition, held at IHTC 2015. Moving right from Mr. Herrera: Zaeem Queshi, UOttawa Student Branch; Joan Kerr, Industry, Interorganization and Outreach Committee Chair, IHTC 2015; Sawsan Abdul-Majid, Student Paper Contest Chair and Technical Committee Co-Chair, IHTC 2015; Alise Wang, Technical Committee Member, IHTC 2015; Maaz Irfan, UOttawa Student Branch.*

points de vue sur ce que l'avenir réserve aux communautés techniques. Animée par Susan Hassler, rédactrice en chef du magazine *Spectrum de l'IEEE*, qui comptait les panélistes Vanessa DiMauro, PDG et chef de la direction numérique de Leader Networks, Rob "CmdrTaco" Malda, créateur de Slashdot, et Lindsey Pollak, auteure à succès au New York Times et experte des milieux de travail pour post-boomers.

J'ai participé en outre à la séance de stratégie du CA et du conseil de gestion à Saint Thomas (îles Vierges), qui portait sur ce que nous pouvons faire maintenant et au cours des deux prochaines années pour tirer profit

## 1. MGA et CA

Le CA de l'IEEE s'est réuni à cinq reprises durant deux jours chaque fois à Saint Thomas (îles Vierges, 7-10 janvier 2016), à San Diego (10-16 février 2016), à New Brunswick (New Jersey, 16-20 juin 2016), à Singapour (27 août – 2 septembre 2016) et à New Brunswick (New Jersey, 16-21 novembre 2016), chaque réunion ayant été précédée d'une réunion du MGA, à l'exception de la première et de la quatrième. Les réunions ont été précédées de réunions du bureau des activités techniques (TAB) et du bureau des activités éducatives (EAB), d'une durée de un à deux jours.

Ces réunions très intenses comprenaient des comptes rendus de l'ensemble des conseils, unités opérationnelles, comités et organes administratifs, suivis de décisions sur les actions en cours et futures. Les réunions de Singapour ont également porté sur l'initiative de rayonnement industriel.

J'ai participé i) à la formation en ligne des nouveaux administrateurs de l'IEEE; ii) à l'initiation au leadership au sein du CA et du MGA; iii) à des discussions avec divers comités tels que Collaboratec, Métadonnées, Internet des objets, Formation au leadership des bénévoles (VOLT), Vitalité régionale et Villes intelligentes; iv) au forum des directeurs du MGA et aux réunions du bureau du MGA; enfin, v) aux réunions du CA. Le directeur élu de la région 7, Maike Luiken, a également participé à ces trois dernières réunions.

J'ai aussi assisté à une séance plénière sur les communautés techniques de demain. L'activité a permis de recueillir différents

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and to strengthen and deepen our connections to industry, in order to ensure sustained long-term growth?”. At that meeting, I introduced topic #23 “Practitioners as knowledge creators” (engineering practice; use the knowledge in education of new engineers; “closing the loop”; Body of Knowledge by Practitioners). I participated as a member of two teams, Industry Engagement and “Create and Curate Content,” and as a critic of two teams “Value proposition” and “Engaging Young Professionals.” As an observer, I attended “Strategic Standards” and “Mergers & Acquisitions / Partnerships.”

Over the last three years, I have spent much time working on Industry Engagement issues, problem formulation and potential solutions with Directors Bob Parro (R4), Tom Coughlin (R6), James Conrad (R3), Francis Grosz (R5), John Walz (R8), and others.

## 2. IEEE Canada BoD and Other Meetings

The first R7 Executive Committee (ExCom) Meeting (teleconference) took place on February 4, 2016. Streamlining of reporting is being implemented to increase efficiency of the meeting.

The second R7 ExCom Meeting (teleconference) took place March 31, 2016. This meeting was very extensive, with many significant points addressed.

The Spring 2016 IEEE Canada Board Meeting took place in Vancouver, 13-15 May 2016, before the IEEE Canadian Conference on Electrical and Computer Engineering, CCECE'16, held in Vancouver Marriott Pinnacle Downtown Hotel, 15 May - 18 May 2016. The major R7 award ceremony took place at the CCECE'16 Gala. Thanks to the effort of experienced individuals, the conference was very successful.

Region 7 Student/WIE/YP/Mutigenerational Congress and the third face-to-face Executive Committee Meeting took place in Mississauga, ON, 16-18 September 2016.

The IEEE Canada Fall Board Meeting took place in Ottawa, 14-16 October 2016, following an excellent IEEE Energy and Power Engineering Conference, EPEC'16 held at the Shaw Centre, 12 Oct - 14 Oct 2016. We invited several IEEE speakers to our Board meeting. Peter Eckstein, President of IEEE-USA spoke about strong ties and the need for collaboration between the regions. Cheryl Sinauskas, Director of Geographic Activities (MGA) and Jayne Cerone, Senior Director of Governance and Communications (TAB) spoke about the IEEE Yellow Card to deal with disruptive members. Glen Duncan of Tourism Canada spoke about collaboration with IEEE on various initiatives to enhance the presence of IEEE in various cities. The Ottawa Section's AGM was also very well organized and delivered.

These Ottawa events were synchronized with an excellent McNaughton Plaque Unveiling Ceremony, as organized by Dave Kemp, IEEE Canada History Committee Chair. Amir Aghdam and Dave Kemp are working on reprinting General Andrew McNaughton's three-volume biography by John Swettenham (Vol

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des occasions actuelles et émergentes de notre environnement externe de même que pour renforcer et approfondir nos liens avec l'industrie afin d'assurer à l'IEEE une croissance soutenue à long terme. J'ai présenté à cette réunion le point no 23, « Les professionnels comme créateurs de savoir » (la pratique du génie; transmettre les connaissances aux nouveaux ingénieurs; « boucler la boucle »; le corpus de connaissances des professionnels). J'ai fait partie des équipes Mobilisation de l'industrie et « Créer et organiser des contenus », et ai servi de critique au sein des équipes « Proposition de valeur » et « Recourir à de jeunes professionnels ». J'ai participé comme observateur aux réunions sur les « normes stratégiques » et les « fusions, acquisitions et partenariats ».

Au cours des trois dernières années, je me suis investi dans les questions de mobilisation de l'industrie, de formulation de problèmes et de solutions potentielles avec les directeurs Bob Parro (R4), Tom Coughlin (R6), James Conrad (R3), Francis Grosz (R5), John Walz (R8) et d'autres.

## 2. CA d'IEEE Canada et autres réunions

La première réunion (par téléconférence) du comité exécutif de la R7 a eu lieu le 4 février 2016. Une rationalisation des rapports est en cours pour accroître l'efficacité des réunions.

La deuxième réunion (par téléconférence) du comité exécutif de la R7 a eu lieu le 31 mars 2016. Cette longue réunion a permis de traiter de nombreuses questions importantes.

La réunion de printemps du CA d'IEEE Canada a eu lieu à Vancouver (13-15 mai 2016) avant la Conférence canadienne de génie électrique et informatique (CCGEI, Vancouver Marriott Pinnacle Downtown Hotel, 15-18 mai 2016). La cérémonie de remise des prix de la R7 a eu lieu durant le gala. On doit le succès de la conférence aux efforts déployés par des personnes expérimentées.

Le congrès étudiant/WIE (femmes en ingénierie)/YP (jeunes professionnels)/multigénérationnel et la troisième réunion en personne du comité exécutif de la R7 ont eu lieu à Mississauga (Ontario, 16-18 septembre 2016).

La réunion d'automne du CA d'IEEE Canada a eu lieu à Ottawa (Ontario, 14-16 octobre 2016) après une excellente conférence de l'IEEE sur l'électricité et l'énergie (EPEC16), tenue au Shaw Centre d'Ottawa (12-14 octobre 2016). Différents conférenciers de l'IEEE ont participé à la réunion du CA. Peter Eckstein, président d'IEEE-USA, a invité à tisser des liens puissants et des relations de collaboration entre les régions. Cheryl Sinauskas, directrice du MGA, et Jayne Cerone, directrice principale de la gouvernance et des communications (TAB), ont suggéré l'attribution d'un carton jaune aux membres perturbateurs. Glen Duncan, de Tourisme Canada, a évoqué la possible collaboration de l'IEEE à diverses initiatives afin d'accroître la présence de l'IEEE dans diverses villes. La réunion de l'AGA de la section d'Ottawa était également très bien organisée et dispensée.

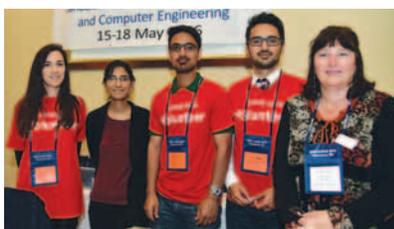
Ces activités se sont agencées avec une cérémonie réussie de dévoilement de la plaque McNaughton, organisée par Dave Kemp, président du comité d'histoire d'IEEE Canada. Amir Aghdam et Dave Kemp travaillent à la réimpression de la biographie en trois volumes du général Andrew McNaughton, écrite par John Swettenham (vol. 1 : 1887-1939, vol. 2 : 1939-1943 et vol. 3 : 1944-1966). La nouvelle ver-



Rodney Vaughan, CCECE 2016 Co-Chair



Rabath Ward, CCECE 2016 Co-Chair



Cathie Lowell, CCECE 2016 Registration Chair, with some student conference volunteers. From left: Maria Zollini, Hiba Shahid, Syed Hamza Mehmood Rufai, Seyed Ehsan Abrishami.

(President's Message cont'd from page 5)

1: 1887-1939, Vol 2: 1939-1943, and Vol 3: 1944-1966). The new version of the book will have a new preface by John Swettenham Jr., and will be distributed to the McNaughton Study Centres in Canada.

The final 2016 ExCom and Steering Committee meetings are planned for December 2016.

I attended the Engineering Institute of Canada's (EIC) Council meeting on March 13 and as a proxy on June 18 (IEEE Canada is a member society of EIC).

The 2016 IEEE Panel of Conference Organizers, POCO'16, took place at the Sheraton Montréal, Quebec, 28-30 July 2016. This conference resulted in many follow ups.

The Canadian Space Society, CSS, organized and delivered the CSS Summit 2016, Inn at the Forks, Winnipeg, MB, Nov 13-15, 2016. IEEE Winnipeg Section was a supporter of the event, and the IEEE logo will also appear in their advertising.

The Conference Advisory Committee (CONAC) Chair, Wahab Almuhtadi, prepared a summary of 34 conferences that took place in R7 during 2016, including: West Area: 18 (Vancouver: 12, Calgary: 2, Banff: 3, Enoch: 1), East Area: 13 (Montreal: 8, Ottawa: 5), and Central Area: 3 (Toronto: 2, Oshawa: 1).

Together with our R7 President Elect and the Past President, we have developed an attendance schedule so that we can cover as many of the 21 AGMs as possible.

### 3. R7 External Relations

Region 7 has been putting much effort into reconnecting Industry with IEEE. For example, Kexing Liu, IEEE Canada Industry Relations Committee Chair, developed a comprehensive position paper entitled "IEEE Canada Industry Relations Plan of Action: Building Strong Industry Connections" that was presented for discussion to the R7 ExCom on February 4, 2016.

I had discussions with the Winnipeg Section to engage industry at a local level. IEEE Senior Members together with members of the Canadian Society for Senior Engineers (CSSE) could develop a program for mentoring Engineers in Training (EIT).

Under the leadership of Raed Abdullah, an IEEE National Society Agreement (NSA) was approved June 1, 2016 between IEEE Ottawa Section and the Canadian Printable Electronics Industry Association (CPEIA), following the first such agreement with the Canadian Remote Sensing Society (CRSS). This led to collaboration with the Canadian Printable Electronics Symposium 2016 (CPES 2016), April 19-20, 2016. An extension of that agreement between IEEE Canada and CPEIA was completed November 29, 2016. Other agreements may follow.

### 4. IEEE Industrial Outreach

IEEE's Directors are expected to play an important role in charting the direction and strategy of the organization and the respective professional disciplines. The Directors are also expected to be IEEE's ambassadors in outreach and strategic connections with business leaders in IEEE's fields of

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IEEE Canada President Witold Kinsner addresses the gathering at the McNaughton Great Canadian Profiles plaque dedication, Oct. 16, 2016.

tion de l'ouvrage comptera une préface signée par John Swettenham Jr., et sera distribuée dans les Centres des ressources éducatives IEEE McNaughton du Canada.

Les dernières réunions du comité exécutif et du comité directeur sont prévues pour décembre 2016.

J'ai assisté à la réunion du conseil de l'Institut canadien des ingénieurs (ICI) le 13 mars et j'ai été fondé de pouvoir le 18 juin (IEEE Canada est une société membre de l'ICI).

Le panel des organisateurs de conférences IEEE 2016 (POCO'16) a eu lieu à l'hôtel Sheraton Montréal (Québec, 28-30 juillet 2016). Cette conférence a donné lieu à de nombreux suivis.

La Canadian Space Society (CSS) a organisé et dispensé le Sommet CSS 2016 à l'hôtel Inn at the Forks de Winnipeg (Manitoba, 13-15 novembre 2016). La section de Winnipeg de l'IEEE a parrainé l'événement et le logo de l'IEEE était visible dans les documents promotionnels.

Le président du Comité consultatif sur la conférence (CONAC), Wahab Almuhtadi, a préparé un sommaire des 34 conférences tenues dans la R7 en 2016, soit 18 dans l'Ouest (Vancouver : 12, Calgary : 2, Banff : 3, Enoch : 1), 13 dans l'Est (Montréal : 8, Ottawa : 5) et 3 au Centre (Toronto : 2, Oshawa : 1).

Avec le président élu et le président sortant de la R7, nous avons élaboré un programme de participation permettant de couvrir le plus grand nombre possible des 21 AGA.

### 3. Relations externes de la R7

La R7 a fait de nombreux efforts pour rapprocher l'industrie de l'IEEE. Par exemple, Kexing Liu, président du comité des relations avec l'industrie d'IEEE Canada, a rédigé un exposé de principes intitulé « Plan d'action d'IEEE Canada en matière de relations avec l'industrie : tisser des liens solides avec l'industrie », qui a été soumis à la discussion lors de la réunion du comité exécutif de la R7 le 4 février 2016.

J'ai discuté avec la section de Winnipeg afin de mobiliser l'industrie à l'échelle locale. Des membres principaux de l'IEEE et des membres de la Société canadienne des ingénieurs seniors (SCIS) pourraient élaborer un programme de mentorat à l'intention des ingénieurs en formation (EIT).

Sous la direction de Raed Abdullah, un accord NSA a été conclu le 1er juin 2016 entre la section d'Ottawa de l'IEEE et l'Association canadienne de l'électronique imprimable (ACEI) à la suite de la conclusion d'un accord semblable avec la Société canadienne de télédétection (SCT). Cet accord a facilité la préparation collaborative du salon canadien de l'électronique imprimable 2016, qui s'est tenu les 19-20 avril 2016. L'accord entre IEEE Canada et l'ACEI a été reconduit le 29 novembre 2016. D'autres accords pourraient suivre.

### 4. Le rayonnement industriel de l'IEEE

Les administrateurs de l'IEEE sont appelés à jouer un rôle important vis-à-vis de l'orientation et de la stratégie de l'organisation et de ses disciplines professionnelles respectives. Ils sont également appelés à servir d'ambassadeurs du rayonnement de l'IEEE et des liens stratégiques avec des dirigeants d'entreprises dans les champs

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**I**mmigrated to Canada in the year 2001, and chose to live in Vancouver. During that summer, the IEEE Power and Energy Society (PES) had a Summer Power Meeting in Vancouver. I was fortunate to volunteer for the event with the hope of networking within the professional community and seeking job opportunities in my own profession.

That IEEE networking experience helped me find my first job. At that time, I also completed my Professional Certification requirement, and eventually landed my dream job with BC Hydro, a power utility in beautiful British Columbia.

In gratitude to the IEEE organization that helped me to settle faster in a new country through networking, I started volunteering. Initially,

even when the opportunities came, I was reluctant to shoulder higher level volunteering responsibilities. However, now that I have an 8-year-old son, I realized that if I do not shoulder higher responsibilities, what kind of example am I setting for my son? I started accepting responsibilities as and when opportunities came my way. In the process, I met several successful personalities and listened to their viewpoints and experiences. I now believe that volunteering is a wonderfully enriching experience personally and professionally. I do believe it is a nice way to give back to society and the community that supported me in many ways.

**Rama Vinnakota**

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interest, as determined in conjunction with the IEEE Ad Hoc Committee on Industry Engagement and the corresponding offices in Region 10. Our objective of such an industrial outreach is to engage with a diverse group of companies related to the IEEE strategy.

The Directors attending the Board meeting have been split into six groups, each visiting a different country to cover the following topics: (i) Information Technology Services in India (Mumbai, August 22-23, and Bangalore, August 24-26), (ii) Government Agencies and Government-Sponsored Industry Incubators in Singapore, (iii) Entrepreneurship and Telecommunications in Shenzhen, China, (iv) Semiconductors in Taipei, Taiwan, (v) Electronics and Robotics in Tokyo, Japan, and (vi) Electronics and Telecommunications in Seoul, South Korea, all from August 30 to September 3. Notice that the India group was held before the BoD meeting to coincide with the Region 10 Jubilee Celebration on August 24.

I stayed in Singapore to use my expertise in the meetings, as well as to establish specific contacts with aerospace researchers and other groups. Our group included Karen Bartleson (2016 IEEE President Elect), James Jefferies (2017 IEEE President Elect), Alan Rotz (Director, Division 7), Lawrence Wong (VP MGA), and Fanny Su Behnoi (Manager of the IEEE Singapore office). We visited (i) the National Research Foundation (NRF), (ii) the Agency for Science, Technology and Research (A\*STAR), (iii) the National University of Singapore (NUS) Enterprise@Blk 71, (iv) the Global Foundries, (v) Singtel, (vi) ST Electronics Pte Ltd, (vii) Cyber Security Agency (CSA) Singapore, (viii) Rolls Royce Singapore Pte Ltd, (ix) Certis Cisco, and (x) Integrated Healthcare Information System (IHIS) Pte Ltd.

Our meetings with the industries addressed the following topics (i) what are the knowledge and technological needs that you have within your industry and global markets?, (ii) what new products and services would deliver more value to you, your company, and your industry?, (iii) how can IEEE better serve the needs of your practicing engineers and technologists?, (iv) how do mid-career engineering professionals stay current with evolving technology?, (v) how can organizations like IEEE support the educational needs of technical professionals through the arc of their careers?, and (vi) is there a role IEEE can play with respect to entrepreneurship and start-ups in your industry and country?

Our group has collected many positive observations from the visits, including (i) strong interests in IEEE standards, specifically in the evolving areas like IoT and cybersecurity, as well as certification of products, (ii) cybersecurity testing on power systems with the inclusion of SMARTGRID 2.0, and a live testbed, (iii) accreditation of cybersecurity programs in Universities through

*IEEE's Industrial Outreach initiative includes visits from Board members to government agencies and companies in six countries: India, Singapore, China, Taiwan, Japan, and South Korea. IEEE Canada President (IEEE Region 7 Director) Witold Kinsner was part of the delegation to Singapore, visiting major corporations and government agencies.*



*Above, the Singapore delegation of the IEEE Industrial Outreach Initiative visit Singtel's Cyber Security Institute.*

*Below, the delegation participates in career day at Rolls-Royce Singapore Pte Ltd.*



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d'intérêt de l'IEEE, comme il a été déterminé avec le comité spécial de l'IEEE sur la mobilisation de l'industrie et les bureaux correspondants de la région 10. L'objectif d'un tel rayonnement industriel est de mobiliser un groupe diversifié d'entreprises en relation avec la stratégie de l'IEEE.

Les administrateurs qui ont assisté à la réunion du CA ont été répartis en six groupes et ont reçu le mandat de visiter chacun un pays différent afin de couvrir les sujets suivants : (i) services de TI en Inde (Mumbai, 22-23 août, et Bangalore, 24-26 août), (ii) organismes gouvernementaux et incubateurs d'industries parrainés par le gouvernement à Singapour, (iii) entrepreneuriat et télécommunications en Chine (Shenzhen), (iv) semi-conducteurs à Taiwan (Taipei), (v) électronique et robotique au Japon (Tokyo) et (vi) électronique et télécommunications en Corée du Sud (Séoul), visites qui ont eu lieu du 30 août au 3 septembre. À noter que le groupe de l'Inde s'est réuni avant le CA pour coïncider avec la célébration jubilaire de la région 10, le 24 août.

J'ai séjourné à Singapour pour faciliter les réunions et établir des contacts avec des chercheurs en aérospatiale et d'autres groupes. Notre groupe comprenait Karen Bartleson (2016 IEEE présidente élue), James Jefferies (2017 IEEE présidence élue), Alan Rotz (directeur, division 7), Lawrence Wong (V.-P. MGA) et Fanny Su Behnoi (directrice du bureau de l'IEEE à Singapour). Nous avons visité (i) la fondation nationale de la recherche (NRF), (ii) l'agence pour la science, la technologie et la recherche (A\*STAR), (iii) l'université nationale de Singapour (NUS), Enterprise@Blk 71, (iv) les Global Foundries, (v) Singtel, (vi) ST Electronics Pte Ltd, (vii) l'agence de cybersécurité (CSA), (viii) Rolls Royce Singapore Pte Ltd, (ix) Certis Cisco et (x) Integrated Healthcare Information System (IHIS) Pte Ltd.

Nos rencontres industrielles étaient centrées sur les questions suivantes : (i) Quelles connaissances et technologies font défaut au sein de votre industrie et sur les marchés mondiaux?, (ii) Quels nouveaux produits et services pourraient vous bénéficier, à vous comme à votre entreprise et à votre industrie?, (iii) De quelle manière l'IEEE pourrait-elle mieux répondre aux besoins de vos ingénieurs et technologues praticiens, (iv) De quelle manière les ingénieurs professionnels demeurent-ils au fait de l'évolution technologique?, (v) De quelle manière les organisations comme l'IEEE peuvent-elles répondre aux besoins éducatifs du personnel technique tout au long de leur carrière? et (vi) L'IEEE peut-elle jouer un rôle concernant l'entrepreneuriat et les entreprises en démarrage dans votre industrie et votre pays?

Notre groupe a recueilli de nombreuses observations positives au cours des visites, dont un intérêt marqué pour (i) les normes de l'IEEE, particulièrement dans les domaines en évolution tels que l'Internet des objets et la cybersécurité, de même que la certification des produits, (ii) les essais de cybersécurité menés sur les réseaux d'électricité au moyen de SMARTGRID 2.0 et d'un banc d'essai en temps réel, (iii) l'accréditation de pro-

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➤ **Valuable tips on how** to become the “Ultimate Leader” are provided in “25 Skills Every Leader Needs Now” [*Canadian Business*. 89 (9):23-35. August, 2016. www.canadianbusiness.com.] Based upon interviews of highly accomplished Canadians the strategies described are important lessons—not taught in the classroom—that will facilitate personal and career success. A selection of these include: making tough calls, how to rally the troops, effective multi- and mono-tasking, mastering your biorhythms, how to stay stoked, mastering new skills, cultivating creativity, grooming a successor, taking a break, mastering the power lunch and staying cool under pressure.

➤ **Profiles of Canadian people,** companies, and technologies that are taking unconventional approaches to solving the energy industry’s biggest problems are provided in Alberta Oil’s article “Canada’s Top Energy Innovators” [11(10):19-37. April, 2016. www.albertaoilmagazine.com]. Innovations in product development, the environment, exploration and development, strategy and operations, and finance are discussed by the Canadian energy industry innovation champions.

➤ **Researched by Deborah Aarts,** Andrea McDonald and Mai Nguyen the special Canadian Business report “Canada’s Fastest Growing Companies” [89(10/11):33-97. October, 2016] provides in the authors words “risk-taking, trailblazing, innovating, job-creating, amazing businesses whose soaring sales and big ambitions are exactly what the Canadian economy needs today...this is what entrepreneurial success looks like. In-depth profiles of many of these new businesses are provided as well as a complete ranking of Canada’s 500 fastest revenue growing companies. Leading the list is Canada Drives (5-year revenue growth of 12,686%), an online portal that facilitates auto financing for consumers; followed by RMS Builders, who construct industrial, commercial and multi-family residential structures; and Buyatab Online, who develops software that helps merchants sell online gift cards.

**First among Canada’s fastest growing revenue companies is Canada Drives, an online auto financing portal**

➤ **The changing diverse face** of the Canadian population has made it imperative for Canadian companies to transition to diverse work environments, ethnic markets, and new ways of managing business. Baisakhi Roy in “The Evolution of Canadian Business” [*Canadian Immigrant*. 13(10):8-12.

# Biz-tech Report



by **Terrance Malkinson**

October, 2016. www.canadianimmigrant.ca] discusses this important topic and builds the business case for diversity and inclusion in the workplace.

➤ **The costs of regular** professional vision-care can be expensive and often is not, or is only partially covered by insurance benefits. Jann Lee in “The Poor Optics of Employee Vision Coverage” [Benefits Canada. 40(9):14-19. October, 2016. www.benefitscanada.com] discusses important issues that are of concern to many Canadian workers. The author also provides information on some innovative solutions that are being implemented by employers and plan providers to provide a better benefit value to the consumer. The uniqueness of technology—now in the workplace—demands an increasing emphasis on the importance of vision care.

➤ **Profiles of over thirty** Canadian prodigies, technology wizards, public servants, financiers and inventors who are seen as the next generation of Canadian business leaders and their success stories are provided in the *Canadian Business* article “Change Agents 2016” [89(12):29-44. November, 2016].

➤ **Strategic use of social media** is helping Canadian grocers make informed marketing decisions, and personalizing messages to cultivate deeper relationships with consumers at a local level. Ken Mark in “Understanding Today’s Social Grocery Shopper” [*Canadian Retailer*. 26(3):12-14. Summer, 2016. www.retailcouncil.org] discusses

the power of this tool to connect to today’s grocery shopper and develop a relationship with consumers at a local level.

➤ **The focus of the** September-October, 2016 issue of *ReNew Canada* [13(5). www.renewcanada.net] is on “Canadian Developments for Reaching Net Zero: Improving Carbon Emissions in Our Built Environment”. A number of articles on Canadian advances in this important area are provided. These include new interprovincial power grids, new building construction techniques, improving industry efficiency, the role of taxation, and asset recycling programs to name but a few.

➤ **The stethoscope reached** its 200th anniversary in 2016. But will the iconic device become obsolete in our digital age? As stated in a CBC news post by Kas Roussy [October 26, 2016] “It’s one of the top inventions in medical history.” A modest 19th-century Parisian doctor, Dr. René Laennec is credited for having invented the stethoscope in 1816. Reluctant to press his ear to the chest of a female patient, he improvised, rolling up a notebook into a tight cylinder putting one end on his patient’s chest and the other to his ear.” And he heard, lub-dub sounds of the heart,” says medical historian Dr. Jacalyn Duffin. The stethoscope resulted in permanent changes in patient treatment.

**Small vision corrections can make a huge difference in work performance**

The standard two-eared rubber-tubing version was developed in the 1850s—decades after Laennec’s death. But recently in a 2014 editorial, Dr. Sanjiv Kaul of Oregon Health and Science University asked, “Is it time to get rid of the antiquated stethoscope? Modern pocket ultrasound devices provide high-quality diagnostic images”, he wrote. adding that “they are easier to use and more accurate.” While the newer devices are not yet standard in Canadian hospitals, some emergency room, ICU and internal medicine physicians are being trained to use them. They are increasingly popular in the U.S. as medical students are introduced to their use in school. ■

## About the Author

**Terrance Malkinson** is a communications specialist, business analyst and futurist. His career path includes technical supervisor and medical researcher at the University of Calgary, business proposal manager for the General Electric Company, and research administrator with the School of Health and Public Safety at SAIT Polytechnic in Calgary. He is currently an international correspondent for IEEE-USA *Today’s Engineer*, contributing editor for *IEEE Canadian Review*, and a member of the editorial advisory board of *IEEE The Institute*. He was Vice-Chair of the IEEE-USA Communications Committee (2004-2010), and editor-in-chief of *IEEE-USA Today’s Engineer Digest* (2004-2008). He was an elected Governor of the IEEE Engineering Management Society as well as past editor of *IEEE Engineering Management*. He is the author of more than 550 earned publications, and an accomplished triathlete. [malkinst@telus.net](mailto:malkinst@telus.net)

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Accreditation Board for Engineering and Technology (ABET) and equivalent bodies, (iv) development of Body of Knowledge for Cybersecurity (CyberBOK) to develop the programs and to guide the accreditation, (v) establishing of a Cybersecurity Taskforce, (vi) future skills upgrading of practicing professionals, (vii) Distinguished Speakers related to industry, (viii) life-long learning through seminars and workshops, (ix) pre-college outreach through the IEEE Engineering Projects in Community Service (EPICS), IEEE's Web-based TryEngineering.org, and the IEEE Teacher in Service Program (TISP), and (x) as expected, conferences are still of major interest, with a specific suggestion to convene a cybersecurity summit.

A major challenge in Singapore is the tremendous growth of the engineering profession and the shortage of talent. Students are interested in engineering, but are opting for areas with even greater needs.

Other reports from the industrial outreach visits are also available from IEEE.

## 5. R7 Inter-Region Collaboration

Region 7 is developing new approaches to inter-regional cooperation, including: (i) direct involvement in conference organization (e.g., the IEEE International Conference on Electro and Information Technology, EIT 2016, held in Grand Forks, North Dakota, May 19-21, 2016); (ii) workshop development and delivery (e.g., R4); (iii) Distinguished Speaker exchanges; (iv) student exchanges between IEEE Branches (e.g., Univ of North Dakota and Univ of Manitoba); and (v) joint AGMs (e.g., Windsor).

## 6. R7 Pre-college and Pre-university Activities

I developed and delivered a one-week Research Discovery Week for Indigenous high-school students at the University of Manitoba this summer (May 9-13, 2016), under the sponsorship of the Verna Kirkness Science and Engineering Education Program. The overall program had 87 students, with half attending the university of Manitoba. The students participate in a very rich set of activities, and present their findings to the entire university at the end of the Discovery Week.

I also developed and delivered a one-week Space Camp for senior high-school students at the University of Manitoba in July 11-15, 2016, under the sponsorship of Aerospace Manitoba and more than 10 other organizations. The camp was attended by 40 students. This hands-on oriented program included workshops, presentations from academia, aerospace industry, and aerospace business.

A one-day Teaching Teachers workshop was prepared for this summer under the TISP program.

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grammes de cybersécurité dans les universités au moyen de l'Accreditation Board for Engineering and Technology (ABET) et des instances correspondantes, (iv) le développement de corpus de connaissances en matière de cybersécurité (CyberBOK) pour élaborer les programmes et orienter l'accréditation, (v) l'établissement d'un groupe de travail sur la cybersécurité, (vi) l'amélioration des compétences des professionnels praticiens, (vii) les conférenciers de renom se rapportant à l'industrie, (viii) l'éducation permanente au moyen de séminaires et de groupes de travail, (ix) le rayonnement auprès des élèves du secondaire au moyen de projets d'ingénierie en service communautaire (EPICS), la plateforme Web TryEngineering.org de l'IEEE et le programme TISP de l'IEEE et (x) la tenue de conférences, notamment d'un sommet sur la cybersécurité.

Un des défis importants qui se posent à Singapour est la croissance exponentielle de la demande d'ingénieurs et la pénurie de candidats. Les étudiants sont attirés par une carrière en génie, mais ils choisissent des domaines où les besoins sont encore plus criants.

On pourra lire d'autres rapports de l'IEEE sur le rayonnement industriel.

## 5. La collaboration au sein de la R7

La région 7 a développé de nouvelles approches de la coopération interrégionale, dont les suivantes : (i) participation directe à l'organisation de conférences (p. ex. la conférence internationale de l'IEEE en électrotechnologie et en technologie de l'information (EIT 2016), tenue à Grand Forks au Dakota du Nord, du 19 au 21 mai 2016); (ii) élaboration et prestation d'ateliers (p. ex. dans la R4); (iii) échanges avec des conférenciers de renom; (iv) échanges entre étudiants de différentes branches de l'IEEE (p. ex. de l'Université du Dakota du Nord et de l'Université du Manitoba); et (v) AGA conjoints (p. ex. à Windsor).

## 6. Activités de la R7 pour les étudiants du secondaire et du collégial

J'ai préparé et dispensé une semaine de découverte de la recherche à l'intention des élèves autochtones du secondaire à l'Université du Manitoba l'été dernier (9-13 mai 2016) sous les auspices du programme d'éducation à la science et au génie Verna Kirkness. Dans l'ensemble, le programme profite à 87 élèves dont la moitié fréquente l'Université du Manitoba. Les élèves prennent part à un ensemble d'activités très intéressantes et présentent leurs constatations à toute l'université à la fin de la semaine de découverte.

J'ai également préparé et dispensé un camp spatial d'une semaine pour les élèves du deuxième cycle du secondaire à l'Université du Manitoba (11-15 juillet 2016), sous les auspices d'Aerospace Manitoba et de dix autres organisations. Pas moins de 40 élèves participeront au camp. Ce programme spécialisé d'activités interactives comprend des ateliers ainsi que des présentations par des chercheurs, des représentants de l'industrie aéronautique et des représentants d'entreprises aéronautiques.

Un atelier pédagogique d'une journée pour enseignants est en cours de préparation pour l'été prochain dans le cadre du programme TISP.

Les projets EPICS de l'IEEE ont mené au lancement du site Web epics.



Students from the South Dakota State University IEEE Student Branch join members of the University of Manitoba Student Branch for project presentation sessions.



Indigenous students pick up some laboratory skills at a Verna Kirkness Camp.



Model rocketry at the University of Manitoba's annual Space Camp gives lift-off to career aspirations in science.

The Engineering Projects in Community Service (EPICS) in IEEE launched a Web site [epics.ieee.org](http://epics.ieee.org) on January 20, 2016. The program is intended to help university and high-school students apply engineering skills to develop solutions for a community's unique challenges. The program will be promoted through TISP. Emphasis will be given to coordinating the activities of TISP, SIGHT and EPICS. Many of us feel that students should be exposed to the adventure of science, engineering and technology sooner than the high-school age. I have been developing STEM outreach approaches to primary-school students through Scouts of Canada. This is coordinated with IEEE 2017 President Elect, Jim Jefferies, and Ron Jensen, Past Director R4, who have been in touch with the Scouts of America. It is also coordinated with IEEE TISP and IEEE EPICS.

## 7. IEEE Canada New Initiatives

Since January 2016, a major project has been undertaken to develop a consistent version of the IEEE Canada Bylaws and its Operations Manual. The project took four months to complete, and the outcome was presented to the R7 Spring Board meeting. An Ad Hoc Review Committee was created to further verify the modifications, and its chair, Raed Abdullah presented their findings at the Fall Board meeting where both documents were approved.

Since March 2016, I have been working on a Task Force for the Engineering Institute of Canada (EIC) Conferences whose global theme is "Sustainable Development in the North." The final report was completed in June 2016, and the findings will be reported here when approved. This conference may have a positive impact on inter-societal collaboration.

A proposal to establish a new recognition in the form of "Friends of IEEE Canada" was presented at the R7 Spring Board Meeting in May 2016. Motivation: IEEE Canada has many friends who should be recognized for their great contributions to Region 7. Examples include (i) industries (e.g., power, telecommunications, computer, aerospace, and health), (ii) business, (iii) R&D, (iv) military, and (v) local governments. IEEE Canada also needs new friends.

A proposal to establish the position of Vice Chair for each IEEE Canada Committee was presented at the R7 Spring Board Meeting in May 2016. Motivation: The transition between chairs and the new Chairs in IEEE Canada Committees includes transfer of knowledge and experience. The VC would learn and acquire the attributes during their one-year term.

A proposal to hold the R7 Fall Board Meeting in Sydney on August 11 prior to the IEEE Sections Congress 2017 (SC2017) was presented at the R7 Spring Board Meeting in May 2016, and approved in October 2016. Motivation: SC2017 will take place

*A solar hot water system for showers at a camp for economically disadvantaged children and youth is IEEE Canada's first project under the IEEE Engineering Projects in Community Service (EPICS) program. IEEE Ottawa Section's Janet Davis (Section Chair) and Wolfram Lunscher (TISP and Conference Committees Chair) mentored local high school students in completing this project at Christie Lake Kids Camp. A photovoltaic system was chosen for ease of maintenance.*



*Four high school students and two adult volunteers carry building supplies by raft to the Christie Lake Kids Camp island.*



ieee.org le 20 janvier 2016. Ce programme a pour but d'aider les étudiants universitaires et les élèves du secondaire à appliquer des compétences en génie à la création de solutions permettant de résoudre des problèmes communautaires particuliers. Le programme sera administré dans le cadre du programme TISP. On veillera à coordonner les activités de TISP, de SIGHT et d'EPICS. Plusieurs d'entre nous pensons que les élèves devraient être exposés à la science, au génie et à la technologie avant le secondaire. J'ai mis au point des approches de rayonnement STEM (science, technologie, génie, mathématiques) auprès des élèves du primaire dans le cadre de Scouts Canada. Le projet est coordonné avec l'aide du président élu 2017 de l'IEEE, Jim Jefferies, et du directeur sortant de la région 4, Ron Jensen, qui a approché les Scouts d'Amérique du Nord. Il est également

coordonné dans le cadre des programmes TISP et EPICS de l'IEEE.

## 7. Nouvelles initiatives d'IEEE Canada

Depuis janvier 2016, un grand projet a consisté à préparer une version cohérente du règlement administratif et du manuel d'exploitation d'IEEE Canada. Le projet a demandé quatre mois de travail et ses résultats ont été présentés à la réunion de printemps du CA de la R7. Un comité spécial d'examen a été créé pour passer

en revue les modifications et son président, Raed Abdullah, a présenté ses constatations à la réunion d'automne du CA où les deux documents ont été approuvés.

Depuis mars 2016, j'ai participé à un groupe de travail pour les conférences de l'Institut canadien des ingénieurs (ICI) ayant pour thème global « le développement durable du Nord ». Le rapport final a été déposé en juin 2016, et nous en ferons mention lorsqu'il sera approuvé. Ce cycle de conférences pourrait avoir un effet positif sur la collaboration entre groupes sociaux.

Une proposition visant à établir une nouvelle reconnaissance intitulée « les amis d'IEEE Canada » a été présentée à la réunion de printemps du CA de la R7 en mai 2016. IEEE Canada a en effet beaucoup d'amis qui pourraient être reconnus pour leurs précieuses contributions à la région 7. On y trouve notamment (i) des industries (p. ex. énergie électrique, télécommunications, informatique, aérospatiale, santé), (ii) des entreprises, (iii) des groupes de R-D, (iv) le ministère de la Défense et (v) des gouvernements locaux. IEEE Canada a aussi besoin de nouveaux amis.

Une proposition visant à établir un poste de vice-président dans chaque comité d'IEEE Canada a été soumise à la réunion de printemps du CA de la R7 en mai 2016. Il s'agit d'assurer une transition des connaissances et de l'expérience entre les présidents et leurs successeurs. Les vice-présidents auraient pour tâche d'acquiescer ces dernières durant leur mandat d'un an.

Une proposition visant à tenir la réunion d'automne du CA de la R7 à Sydney le 11 août, avant le congrès des sections de l'IEEE de

### London Hydro Inc. receives the Supporting Friend of IEEE Member and Geographic Activities Award



L to R: Allan van Damme, Treasurer, IEEE London Section, EPEC'15 Conference Committee, Local Arrangements and Tours; Greg Sheil, Panel Chair at EPEC'15; William A. Milroy, London Hydro VP Engineering and Operations; Witold Kinsner, IEEE Canada President 2016-2017; Maike Luiken, IEEE Canada President Elect 2016-2017. Presented at EPEC'16.

### Learn more about printable, flexible electronics through CPEIA white papers

As part of its partnership with IEEE, the CPEIA is sharing white papers to raise awareness of printable and flexible electronics in a variety of market verticals. See: <http://cpeia-acei.ca/cpeia-whitepaper-series/>

Community outreach and education is a core component of the CPEIA mandate, and an area with great potential for collaboration between the CPEIA and IEEE. Interested IEEE Members can download these white papers at no cost to learn about use cases and applications.

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## President's Message/Message du Président

(President's Message cont'd from page 11)

in Sydney, Australia, August 11 to 13, 2017. POCO will also be colocated there. Region 7 will also hold a Strategic Planning Session after the Sections Congress. Maike Luiken has completed a preliminary analysis of the costs and looked at several options. Conclusion: It could be done within our budget.

A proposal to hold a strategic discussion session at the end of each R7 Board Meeting was presented at the R7 Spring Board Meeting in May 2016. Motivation: The proposal is intended to engage IEEE Canada Sections in the strategic planning process.

New Web-based forms have been developed by Maike Luiken to simplify our operations such as nominations for various positions.

A new video on IEEE Canada has been released this year, thanks to the effort of our Past President, Amir Aghdam.

Discussions are taking place towards establishing a President's Advisory Ad Hoc Committee in IEEE Canada.

On another note, please consider supporting our IEEE Canadian Foundation in its efforts to sponsor student activities and experiential-education infrastructure for the many Student Branches in Canada. ■

Respectfully submitted,

**Witold Kinsner,**  
PhD, PEng, FEIC, FEC  
2016-2017 IEEE Canada President  
2016-2017 IEEE Region 7 Director

(Message du Président suite de p. 11)

2017, a été soumise à la réunion de printemps du CA de la R7 en mai 2016 et a été approuvée en octobre 2016. Le prochain congrès ISC17 aura lieu à Sydney (Australie, 11-13 août 2017). Le POCO y aura lieu également. La R7 tiendra par ailleurs une séance de planification stratégique après l'ISC17. Maike Luiken a fait une analyse préliminaire des coûts et a examiné diverses options. En conclusion, il serait possible de tenir cette réunion en respectant notre budget.

Une proposition visant à tenir une séance de discussion stratégique à la fin de chaque réunion de CA de la R7 a été soumise à la réunion de printemps du CA de la R7 en mai 2016. Il s'agit de faire participer les sections d'IEEE Canada au processus de planification stratégique.

Maike Luiken a élaboré de nouveaux formulaires Web afin de simplifier nos opérations telles que les mises en candidature pour différents postes.

Une nouvelle vidéo sur IEEE Canada a vu le jour cette année, grâce aux efforts de notre président sortant, Amir Aghdam.

Des discussions sont en cours pour établir un comité consultatif spécial du président au sein d'IEEE Canada.

Enfin, j'en appelle à votre soutien de la Fondation canadienne de l'IEEE ses efforts de parrainage des activités étudiantes et de l'infrastructure d'apprentissage empirique de nombreuses branches étudiantes au Canada. ■

Présenté respectueusement,

**Witold Kinsner,**  
Ph.D., ing., FEIC, FEC  
Président d'IEEE Canada pour 2016-2017  
Directeur de la région 7 de l'IEEE pour 2016-2017

# IEEE Canada IHTC 2017 — International Humanitarian Tech. Conference

TORONTO, CANADA – JULY 20-22, 2017

WWW.IHTC2017.IEEE.CA



Photo: U.S. Coast Guard, Niyalmo Cangemi



Photo: OLE Nepal, Om Yadav

## Student Design Contest

Design projects seeking to solve Humanitarian issues using Technology done from July '15 to June '17 are welcomed. Judging to be based on innovation, feasibility, relevance to real-world problems and cost-effectiveness.

The theme of IHTC 2017 is “Innovate and Collaborate for Sustainable Development” with emphasis on policies, practices, and technologies aimed at building resilient communities. IHTC 2017 is a unique conference that will focus on humanitarian applications of technologies, aligning with Sustainable Development Goals of the United Nation: Mainly, sustainable development of communities, health, disaster mitigation and management; and engineering education with an emphasis on humanitarian issues. The conference will feature outstanding keynote speakers, workshops, a student paper/design competition, and peer-reviewed papers.

## CALL FOR PAPERS

The technical program committee invites you to submit a 200-300 word abstract of a paper in any of the following track areas.

### Technologies for:

- Poverty alleviation, achieving food security and improved nutrition and promote sustainable agriculture.
- Effective management of refugees, (re)settlements and integration
- Ensuring healthy lives and promote well-being for all at all ages
- Quality education and promote lifelong learning opportunities for all
- Sustainable management of water and sanitation for all
- Affordable, reliable, sustainable and modern energy for all
- Making cities and human settlements safe, resilient and sustainable
- Disaster mitigation, management, relief, and recovery
- Combating climate change and its impacts
- Social impacts of technology
- Data and personal security humanitarian technology
- Humanitarian and educational technologies
- Community engagement

## IMPORTANT DATES

5-page full papers due (IEEE PDF Express format)	Feb. 15, 2017
Proposals for tutorials and workshops due	Mar. 31, 2017
Authors notified about acceptance and modifications	Apr 30, 2017
Submission of camera-ready papers	May 31, 2017

## TUTORIALS, WORKSHOPS, PANELS

Proposals are invited for half-day tutorials, workshop on new and emerging topics within the scope of the conference.

Please describe the content, importance and timeliness, the speaker(s), brief CVs, and where appropriate, topics each will cover. For further info, contact: [xavier@ieee.org](mailto:xavier@ieee.org)

Proposals due March 31, 2017

## SUBMISSIONS

All materials to be uploaded by registering with: <http://edas.info>

Please use PDF format for both papers/paper abstracts, as well as proposals for tutorials, workshops and panels. Detailed information on paper format and submission procedure can be found on the conference website.

## WHO SHOULD ATTEND?

The target audience for the conference includes researchers, practitioners and students in the fields of sustainability, human development, education, disaster relief, STEM fields and management sciences as well as interested professionals and anyone wanting to contribute their talents on the humanitarian and sustainable development fields.

**Exhibition:** Showcase your products and services to Canadian and international audiences. For more details please go to: <http://www.ihtc2017.ieee.ca/patronage-exhibition>



For detailed up-to-date information, visit the Conference web site:  
<http://www.ihtc2017.ieee.ca>



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Raymond Ly

# Siksika Nation – The future is looking up

For tens of thousands of years, the Siksika-itsitapi have studied and recorded the motions of celestial bodies. Today, this knowledge is emerging from the past to reveal a vision of the future — one that reaches the planets and beyond!

By **Tusha Sharma, Bruce Rout, David Garrett and Anis Ben Arfi**

**S**iksika Nation is a First Nations community situated an hour's drive east of Calgary in an optically-dark and radio-quiet zone. It is the second largest reservation in Canada, and is about 60 km in width.

The Siksika education department, in collaboration with other universities, is discussing building significant optical observatories on the reserve and providing telescopes for other schools in the Canadian province of Alberta. This would turn this isolated community into a major centre of astronomical research, and provide data and research projects for university-level and professional astronomers. Not only focusing on astronomy, our goal is to expand the horizons of education into various disciplines which can bring in more value to the community. After devastating floods in 2013, we now look forward to making a technically empowered sustainable community.

This will have a major impact on opportunities for community members of all ages. The project will benefit both those on the reserve and those in the surrounding community, building bridges between native and non-native people through the mutual exchange of educational outreach. Students will come to a greater understanding of their own history and the activities of their ancestors. They will become more connected to their Blackfoot, (or Niitsitapi – “that which is real”) heritage. The motto of this project is simple: “You, the Sky, and the Land.”

## Basic Radio Astronomy - Hands on Equipment for School Kids

As a means of connecting the local people both with technology and the universe around us, radio astronomy is being explored as an activity on the reserve. Community events have shown a great interest from the local people in astronomy, especially given their rich history of storytelling about the stars. Community members will build half-wave dipole antennas to receive radio signals emitted from Jupiter and the Sun. Low-cost receivers will then be assembled by means of component soldering and tuning, allowing the signals to be recorded on a computer. This data will then be shared online in a growing community of radio astronomy enthusiasts.

Discovered accidentally in 1955 at the Carnegie Institute in Washington, DC., radio emissions from Jupiter are formed from the complex interaction between ionized gas and its moon Io.

*(continued on Page 16)*

## Background to Projects

In the year 2015, Dr. Deborah Scherrer, Director of Stanford Solar center, and Dr. Phil Scherrer, Professor, Stanford University visited the Siksika Nation to commence the International Year of Light initiative started by IEEE Southern Alberta Section (SAS) Young Professionals, under the leadership of Tushar Sharma. Bruce Rout, Co-Founder of Astronomy Teacher



Tushar Sharma and Drs. Phillip and Debbie Scherrer of Stanford Solar Centre enjoy a brisk evening on an effigy mound east of Blackfoot Crossing.



A radio astronomy feedhorn adjacent to the Siksika Nation High School.

**This is not the first foray into astronomy for the Blackfoot nation. They have been studying the stars and seeking their place in the universe for tens of thousands of years.**

– Bruce Rout

Training Institute (ATTI) arranged a meeting and session in Siksika. The Stanford Solar center was very interested in supporting this initiative, and provided its materials and courses for developing their community and improving academic achievement. A meeting was arranged with the Chief and Council at Siksika, and soon afterwards the needed approval was secured.

*(continued on Page 18)*



The Majorville Medicine Wheel was built before Stonehenge and is based on the position of the stars more than 5,000 years ago. Here, Elder Connie Crop Eared Wolf and her husband Andy examine a plaque at the entrance to the site.

## Summer 2016 Program Highlights

IEEE Young Professionals and Special Interest Group on Humanitarian Technology (SIGHT) group in Southern Alberta had meetings with Chief Yellow Old Woman and Council, and the Siksika Board of Education, which kicked off a summer science program for local children in 2016. A small building behind Old Crowfoot School was secured, cleaned and prepared to use as a base for the upcoming summer project and as a hands-on training centre for future programmes. The graduate students team helped to clean and restore the building and develop the education program for the summer school.

Local teacher, Nadine Solway, volunteered as a programme assistant and adviser on Blackfoot culture and the summer program began. A field trip to the Majorville Medicine Wheel was organized for students and accompanying Elders, who had never before visited it; all were deeply moved by the rediscovery and witnessing of the activities of their own ancestors. The Medicine Wheel was built before Stonehenge, and is based on the positions of the stars more than 5,000 years ago. Although the site has been disturbed and vandalized by local and federal governments and tourists, the structural outlay and positions of major demarcations are intact.

Further summer activities included: the mathematics of tipis, rockets, observing the Moon, chemical reactions, making and flying kites and field trips to the Telus Spark Science Centre and the Blackfoot display at the Glenbow museum in Calgary. This provided students with a wide and balanced view of various sciences. Many of the students had not been off of the reserve before. The Summer science program ended with another field trip to the Medicine Wheel with Dr. Genevieve Fox, the Superintendent of the Siksika Board of Education.



Local teacher Nadine Solway studies one of the Okotoks (rocks) at the Medicine Wheel



Anis Ben Arfi and David Garrett prepare class.

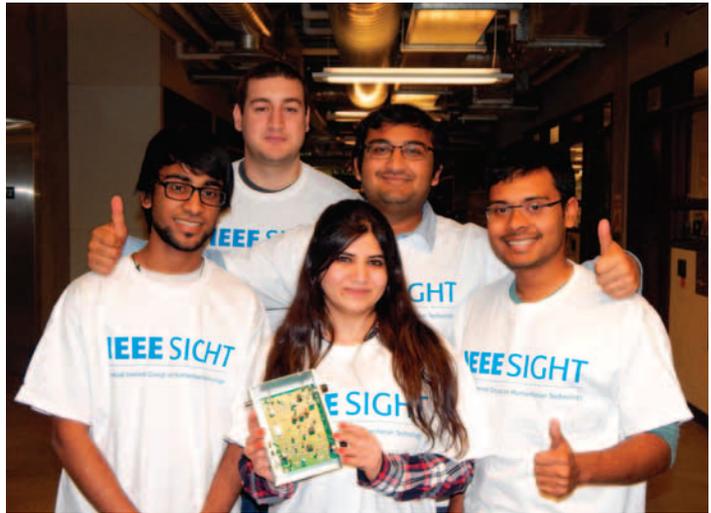


Bruce Rout demonstrates chemical reactions

The summer science program was a discovery that Blackfoot culture and science are not only complementary, but are intertwined. There is no division between culture and science. Science, in studying the relationship between truth and reality, forms the social culture of Blackfoot people. ■

Traveling almost 600 million kilometers, these signals are so powerful that they can be easily received on Earth. Emissions are generally below 40 MHz, but the Earth's ionosphere reflects and absorbs much of the radiation below 15 MHz. The NASA Radio Jove project was initiated to provide a low-cost method of listening to these emissions. These receivers operate at 20.1 MHz, which is a relatively quiet portion of the radio spectrum. They use a direct-conversion architecture, whereby the 20.1 MHz radio signals are mixed down to audible frequencies. Audio is directly output from the receivers and input into a recording computer. Radio activity on Jupiter can then be directly heard, with the two common types being L-bursts, which sound like ocean waves, and S-bursts, which are more percussive and sound like popping popcorn. Signals are received using an array of two half-wave dipole antennas. By reconfiguring the height, orientation, and phase delay in the antennas, the primary radiation beam can be steered to follow Jupiter's optimal position during each season. Emissions from Jupiter are best heard at night when the Sun's emissions are less prominent, and the Earth's ionosphere is less ionized.

This project aligns with the vision of developing a world-class radio astronomy centre on the reserve, presenting a first step to developing the technical framework for future projects. Throughout this process, reserve members will develop practical skills such as soldering, web development, and antenna design. The location of the reserve is optimal for these measurements, where the radio-quiet zone will be useful in obtaining clean results. Prior to installing systems on the reserve, customized modules were developed and assembled by the Young Professionals team in the IEEE Southern Alberta Section at the University of Calgary. Using 20-foot-tall PVC masts, two dipole antennas were raised and connected to an assembled receiver, and preliminary measurements have been performed.



The IEEE Special Interest Group on Humanitarian Technology (SIGHT) at University of Calgary with Radio Jove circuit board

that can be used by amateur radio astronomers in and around Siksika for different experiments. The basic interferometer is a pair of radio telescopes whose voltage outputs are correlated (multiplied and averaged).

## Amateur Radio

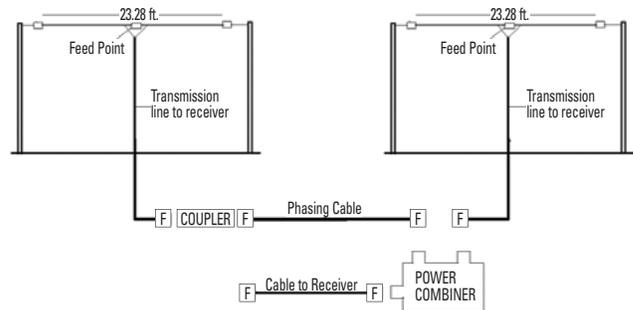
To continue technical development on the reserve, amateur radio courses are to be held through the winter of 2016/2017. Community members will work towards amateur radio certification through the successful completion of a 100-question multiple-choice exam. Throughout several weeks, members will participate in enjoyable activities which will gradually introduce the relevant topics, where the focus will be on hands-on learning. By highlighting practical applications of amateur radio such as emergency communication and local network deployment, members will be working simultaneously



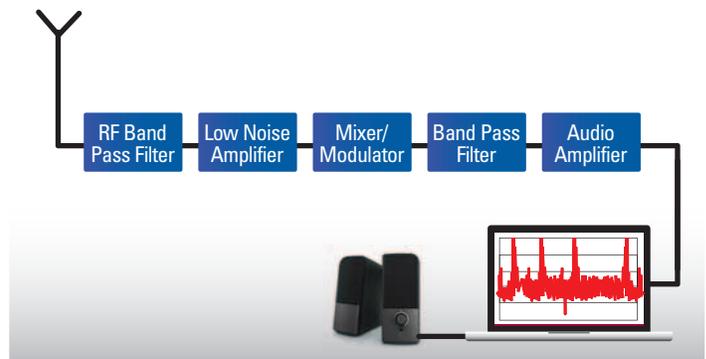
Assembled NASA Radio Jove antenna on the University of Calgary campus

## Radio Astronomy Componentry

Since Siksika reserve is a radio quiet zone, the development of a scientific skill set among students is a goal introduced both in hands-on and classroom teaching. Single radio astronomy units have a limited spatial resolution at high frequencies. To enhance this spatial resolution, these single radio units are combined into multiple-element arrays that work as a single array. To start with, individual or groups of students can assemble a two-element array, which consists of a simple pair of dipole antennae, along with a direct convergent receiver that students can solder and assemble. The middle level and high schools students will focus on using dipole antennae and optimizing different antenna geometry to customize different shapes that can be used for radio astronomy observations. As part of an advanced module, students will simulate the receiver chain, advanced antenna geometries and build a standalone interferometry system



Connection of two di-pole antennas to create a simple array



Block diagram of a simple radio receiver used for measurements



Amateur radio events held at the University of Calgary have attracted large attendance from students and the local amateur radio community

towards their certification and the betterment of the reserve. For instance, a radio link will be established between the reserve and the University of Calgary. With many of the reserve members without cell phones or internet access, this will provide a continued bond between Siksika Nation and university students, where experience and knowledge can be shared. Members of Calgary's local amateur radio community will also be assisting in preparing the community in case of future emergencies such as the 2013 floods that left the area in a state of disarray. Equipment and training will be provided. A high frequency (HF) and very high frequency (VHF) station will be assembled at the Siksika Nation high school, where students and other community members can get on the air and speak around the world.

Topics such as radio wave propagation, transceiver architecture, and modulation schemes will be explored. Many of the skills taught in this process are transferable to other areas of employment and study. The amateur radio license is a widely recognized achievement that would be an attractive asset in the search of employment. It is anticipated that through the emphasis of enjoyable and interesting aspects of science and engineering, members will gain the motivation to complete their high school education and pursue university or college studies.

## Optical Telescope

Dark sites are becoming quite rare. Steward Own Chief, the Siksika council member for Education, has suggested the use of the Poor Eagle Camp site on Siksika as a dark site for a future optical observatory. The mirror-making laboratory at the University of Arizona has proposed providing assistance and large telescope mirrors for such an observatory. The University of Lethbridge and Mount Royal University have also expressed interest in a joint venture with Siksika to build a research-grade optical telescope.

Renewable energy solutions have been suggested to provide electrical power to this isolated site with the instructional assistance and guidance of IEEE SIGHT. The IEEE SAS already hosted a hands-on training on micro electrification using solar energy. This will provide more high tech educational opportunities for students in the program.

## Benefits to SAS YP/SIGHT/IEEE MTT SA

This is not just a one-way benefit to the people of Siksika; SAS Young Professionals members stand to receive huge benefits from their involvement as well. These benefits include: enrichment in terms of circuit design and other technical skills, learning about a different culture, and perceiving the role that science plays in that culture. Students will develop adaptation and communication skills transferrable to future different workplace cultures, in potentially many different countries and regions of the world. Furthermore, the consultative aspect - working with



The architecturally unique Blackfoot Crossing Cultural Centre is proposed as the site for future astronomical conferences.

those who will use the technology – is invaluable, as is the enhancement of presentation and interpersonal skills. This initiative is being led by IEEE student and graduate student members in a model for fostering sustainable community development through demand-driven projects that can be applied throughout the entire IEEE community.

## Benefits to Siksika

For young and old members of the reserve alike, a renewed interest in technology and science will be developed, motivating them to pursue careers in those areas. Technical and professional skills will be acquired by members, while maintaining a deep connection with their history and culture. For the community as a whole, this will be empowering on multiple levels; the local people will be able to take charge and be self-sustaining, leading to a bright prosperous future. Siksika stands to be a model for other reservations in North America.

## Professional Growth to Community

These continuing education projects on Siksika reserve will help the youth to get engaged, learn and share knowledge with the outside world. Starting with amateur radio astronomy projects which will help in nurturing basic science education, HAM Radio will equip the community to get connected with the outside world and prepare a task force for emergency response. Training the youth on solar electrification and deployment will also help enhance their professional and technical skillset which can help them to shape a career. The amateur radio site is expected to be a center wherein amateurs from nearby areas in Alberta can come for optical and radio night sky observations. The team envisions developing this as a hub for amateur education programs which will be run by the people, of the people and for the people.



## Larger aspect of Community Empowerment

The community will be empowered through this program. Siksika people are to direct it. The program will evolve through the growing experience and skills of local participants. Progress will be achieved through short-term, easily achievable and easily accessible goals. As the project progresses,



Bobbi Running Rabbit



Kayci Breaker

(Background to Projects... continued from Page 14)

Mr. Rout has been visiting and engaging the Siksika Nation for the past six years. The project is overseen by ATTI, which was founded in 2014 by Bruce Rout and Tushar Sharma. Other founding members of ATTI included Dr. Martha Manygreyhorses of the University of Lethbridge, and Cameron Rout, a Yale Business School graduate. Dr. Rob Cardinal, who is from Siksika (and has a comet named after him), lent support and assistance in initiating this project. Mr. Sharma, through his membership with IEEE, is leveraging volunteer expertise and enthusiasm from University of Calgary students to teach and instruct Siksika students and community members as the project unfolds. With the support of a great team of graduate students from the University of Calgary including the chair of IEEE SIGHT Southern Alberta Section, Mr. Anis Ben Arfi, vice chair Mr. Martin Berka, and the founder of Amateur RadioClub at the University of Calgary, Mr. David Garrett, this group is helping to execute the sessions and building a great program for the community.

it will involve identifying people of capacity and enabling them to be facilitators of various future projects which will arise organically. It is hoped students at Siksika will visit local non-native schools to teach astronomy and to help teachers.

True empowerment lies with knowledge. The source of knowledge lies with the individual. Through action and through responding to challenge, humanity progresses. We anticipate the people of Siksika as world leaders in education and community development. ■

In preparation for the Siksika Astronomy project, Mr. Rout attended the 2016 summer conference of the American Astronomical Society (AAS) in San Diego to present a paper on galactic structure, and to promote the Siksika program. While there, Mr. Rout met with past and present presidents of AAS as well as professional astronomers from major universities throughout the US. From this, the use of Siksika as a future astronomy facility was discussed. This would provide data for American university students who are hard-pressed for professional optical and radio observation time. Also, as a result of this conference, the AAS educational chairman is looking to provide raw data from the Chandra X-Ray observation satellite for Siksika students to analyze. Through Mr. Rout, ATTI is now an educational affiliate of AAS opening access to resources from NASA, JPL and other major astronomical facilities throughout the world. ■

## Support for Siksika Nation Initiative by IEEE HAC

“The IEEE mission and vision is to apply our engineering profession to leverage technology in creating a better tomorrow. IEEE seeks to impact our world through technical solutions that empower people to achieve sustainable development while partnering with underserved communities and local organizations.

We as engineers should not be developing technology and then looking for problems to solve; instead we need to listen to the voices calling out the needs and creating together with local partners appropriate solutions.

The radio astronomy / amateur radio / optical telescope program led by YP/MTT-S IEEE Southern Alberta Section is truly an innovative platform for STEM education, scientific discovery, and potential economic benefit to the Siksika Nation. Its success points the way to how the IEEE can simultaneously serve the global community and provide empowerment for the local community. ”

**Tim Lee** IEEE Humanitarian Activities Committee,  
Partnerships IEEE MTT-S SIGHT Chair

“Local and indigenous capacity-building is a core value of IEEE SIGHT (Special Interest Group on Humanitarian Technology); we seek to support underserved communities in their development efforts by leveraging technology solutions. This is in alignment with the history of siksika-itsitapi because of the astronomical observations and studies done by the community since thousands of years ago. We are excited to learn about the positive outcomes from this community engagement. ”

**Kartik Kulkarni** IEEE Humanitarian Activities Committee

## Bios

**Tushar Sharma** received his Bachelors of Technology in Electronics and Communications engineering from GGSIPU, Delhi and currently he is pursuing his doctoral studies at University of Calgary. His research interests focus on RF/Microwave Power Amplifiers, System Level Design, RF Circuit Design, High-Efficiency Broadband Power Amplifiers, Waveform Engineering, active and passive load-pull techniques, etc. He is currently working as a Research and Development design intern at NXP Semiconductors. Tushar has been an avid IEEE volunteer for the past eight years and is leading the community development initiative at Siksika.

**Bruce Rout** currently works at Siksika Nation as an Educational Consultant using astronomy to further community development. Mr. Rout graduated with a Masters degree in Mathematics from SFU in 2002 after obtaining a Bachelors degree in Astrophysics at U of A. Mr. Rout has done scientific research with AOSTRA on Alberta oil sands, developed automated brokerage systems for the New Zealand Stock Exchange and was a member of the national task force for RCMP resourcing as a mathematical consultant. Mr. Rout has been a high school teacher for 20 years and has recently presented a paper to the American Astronomical Association on galactic structure.

## Acknowledgements

This is a joint initiative by IEEE Young Professionals Southern Alberta, SIGHT, Siksika Board of Education, MTT-S, Astronomical Teacher Training Institute, NASA Radio Jove, Stanford Solar Center, IEEE Antenna and Propagation Society and the IEEE PES. The authors wish to acknowledge and thank their partners for their support and assistance in this ongoing project.

# Expanding the Reach of the IEEE Winnipeg Section

By **Dario Schor**  
Chair, IEEE Winnipeg Section

The IEEE Winnipeg Section has close to 450 members in Manitoba and Northwestern Ontario. Such a large territory made it difficult in the past to engage all members, reach student sections located outside the Winnipeg area, and have face-to-face interactions with nearby sections. Although there are many tools to facilitate collaboration and some were tried in recent years, it requires extraordinary efforts from many people to establish these connections. The following two examples highlight some of the recent initiatives to revitalize the membership across geographical distances.



## Cross-Regional Collaboration

On Sunday, September 11, 2016, the University of Manitoba IEEE Student Branch (UMIEEE) hosted a delegation of students from the South Dakota State University IEEE Student Branch. The students were treated to tours of local power



systems companies, a tour of the University of Manitoba, presentations from various student projects, and a dinner at a local restaurant. This was a unique collaboration of student branches from Region 4 and Region 7 that we hope will be repeated in the near future. This event was made possible thanks to Dr. Witold Kinsner (UofM) and Dr. Reinaldo Tonkoski (SDSU) and UMIEEE officers Chelsea Taylor, Matthew Kehler, Mark Rabena, and Erik Johnson who hosted the activities at the University of Manitoba. Plans are already underway for more visits in the future.

## WebEx Seminars & Meetings

The distance between Winnipeg and Thunder Bay is around 600 km, so travelling for a meeting



or seminar is not always practical. However, thanks to the efforts of Dr. Ian Jeffrey (University of Manitoba), Dr. Christopher Henry (University of Winnipeg), and Dr. Laura Curiel (Lakehead University), physical distance is no longer a problem. The recent seminars and meetings have been broadcast with WebEx (<http://sites.ieee.org/vtools/>) enabling us to reach and engage the Lakehead University student branch located in a different time zone. Furthermore, this enables members within the same city to attend seminars across town thus increasing the presence of IEEE within the Winnipeg Section.

Any initiative to organize events in different cities requires a lot of planning and collaboration. Whether it is a physical trip or a virtual collaboration, the individuals need to plan for international travel, coordinate event logistics, test audio/video connections, and many more tasks to make the events run smoothly. We encourage other sections to do the same and look forward to collaborations with others as we continue to add value for IEEE members. ■

*(Bios... continued from Page 18)*

**David Garrett** completed his B.Sc. in Electrical Engineering at the University of Calgary in 2016, where he is currently working towards his M.Sc. in Electrical Engineering. During his B.Sc., he spent one year in an internship with ABB Corporate Research in Baden, Switzerland, working on dielectric testing and characterization. His current research focus is on radio frequency systems for biomedical sensing applications. He is the current chair of the IEEE Microwave Theory and Techniques Society (MTT-S) Student Chapter at the University of Calgary.

**Anis Ben Arfi** completed his B.Sc with Honours from SUP'COM Tunis, then joined the Schulich School of Engineering, University of Calgary as a graduate student after showing promising research skills and being awarded with a scholarship to carry out his research activities with the iRadio Lab team. His research interests centre on the performance of low-power transceivers, mainly through the application of new types of modulation schemes, software defined devices, digital predistortion techniques, and wireless sensors networks. Anis is currently the president of the Graduate Engineering Students Consortium at the University of Calgary and the chair of the IEEE Special Interest Group on Humanitarian Technology (SIGHT) Southern Alberta Section.

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# CCECE 2017

## The 30<sup>th</sup> Annual Canadian Conference on Electrical and Computer Engineering

April 30 to May 3, 2017, Windsor, Canada

<https://ccece2017.ieee.ca>

*“Two Great Nations Innovate the Technology”*

### Call for Papers and Proposals

The 30th annual IEEE Canadian Conference on Electrical and Computer Engineering (CCECE 2017) will be held in Windsor, Canada from April 30 to May 3, 2017. CCECE 2017 provides a forum to disseminate research advancements and discoveries, network and exchange ideas, strengthen existing partnerships, and foster new collaborations. Its theme “Two Great Nations Innovate the Technology” reflects the close direct impact of ECE research on industrialization and the position of Windsor as a border city to USA. The venue is Caesars Windsor. Papers are invited in the following Tracks:

▶ <b>BIOENGINEERING</b>	Chairs: M. Avanaki (WSU, USA), H. Dajani (U. of Ottawa), A.L. Trejos (Western U.)
▶ <b>COMMUNICATIONS AND NETWORKS</b>	Chairs: A. Anpalagan (Ryerson U.), W. Hamouda (Concordia U.)
▶ <b>COMPUTER AND SOFTWARE TECHNIQUES</b>	Chairs: H. Wu (U. of Windsor), A. Youssef (Concordia U.)
▶ <b>CONTROL AND ROBOTICS</b>	Chairs: X. Chen (U. of Windsor), H. Li (U. of New Brunswick)
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### Important Dates

Proposals for Tutorials and Special Sessions ( <i>Extended</i> ); email: <a href="mailto:ahmadi@uwindsor.ca">ahmadi@uwindsor.ca</a>	February 17, 2017
Full paper submission ( <i>Extended</i> ):	February 24, 2017
Acceptance notifications ( <i>Extended</i> ):	March 17, 2017
Final version paper with registration ( <i>Extended</i> ):	March 24, 2017

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# 2016: Alberta celebrates two Advanced Education Milestones

By **Terrance Malkinson**

In 2016, two of Alberta’s major post-secondary education institutions reached important milestones. The Southern Alberta Institute of Technology celebrated its 100th anniversary and the University of Calgary celebrated its 50th anniversary. The history of these two institutions is intertwined and today, together, both educational providers offer a comprehensive and complementary package of education opportunities to meet the demands of today’s business market. Indeed, the educational paths of many skilled workers include credentials from both institutions. Students often find that the more theoretical and basic education that they receive from the University when accompanied by the hands-on applied polytechnical education at SAIT are a perfect combination for lifelong career success.

## SAIT 100th anniversary



Photo: SAIT

SAIT’s President and CEO Dr. David Ross welcomes the public, staff, students and alumni to SAIT’s centennial celebrations.

The Southern Alberta Institute of Technology ([www.sait.ca](http://www.sait.ca)) has a remarkable history that began in 1916 with its creation as the Provincial Institute of Technology and Art (PITA) in downtown Calgary. Eleven students attended hands-on sessions in motor mechanics and metal working—gaining the skills to meet practical needs of employers.

One hundred years later, roughly 35,000 applicants vie each year for spaces in eight academic schools: Business, Construction, Energy, Health & Public Safety, Hospitality & Tourism, Information and Communications Technologies, Manufacturing & Automation, and Transportation. Valued partners from business and industry serve on SAIT’s program advisory committees, ensuring

(Continued on page 22)

## University of Calgary 50th anniversary

The University of Calgary [[www.ucalgary.ca](http://www.ucalgary.ca)] was established in 1966, but its roots date back to the establishment of the Normal School in downtown Calgary in 1905 that trained primary and secondary school teachers. In 1922 the Calgary Normal School relocated to the campus of the newly built Provincial Institute of Technology and Art (PITA). Groundbreaking for a University campus was held in November 1958. In the fall of 1960 classes moved from the Provincial Institute of Technology and Art to the new 300-acre campus in two buildings: Arts and Education, and Science and Engineering. A strong movement emerged in Calgary to lobby for the creation of an autonomous university. This campaign reached its goal in 1966 with the establishment of the University of Calgary. Herbert Stoker Armstrong was installed as



Photo: University of Calgary

University of Calgary under construction.

(Continued on page 24)

students continue to receive hands-on, practical training that reflects the current and future needs of the workplace. In all programs there are many more applicants than spaces available.

Surveys regularly reveal that over 90% of graduates obtain employment upon graduation; and 80% of those are employed in positions related to their training. Employer surveys reveal that 99% of employers said they would hire a SAIT graduate again. SAIT has been chosen as one of Alberta's top employers five times. Over \$3.9M is dispersed annually to students through more than 3,600 awards, bursaries and scholarships. Today, SAIT offers day-time programs; apprenticeship programs and earned revenue credit and non-credit programs as well as numerous corporate training offerings. To help prepare newcomers to Canada to succeed in its programs, English language foundations and academic upgrading are also offered.

## SAIT Polytechnic education is characterized by:

- Close ties with business and industry to ensure programs reflect needs of the workplace; seven Centers of Technology have been established through these partnerships.
- Diverse programming in technical, business and creative fields, with a balance of skills-based and theoretical learning.
- A range of credentials from certificates and apprenticeships to bachelor degrees, and options to obtain professional credentials.
- Opportunities for students to participate in applied research and projects with industry.

SAIT was a founding sponsor of WorldSkills Calgary 2009 — an international student competition devoted to raising awareness that the skilled trades and technologies are vital to the global economy. Some 150,000 visitors attended WorldSkills 2009. The SAIT campus served as the Competitors' Village.

Looking to the future SAIT's President and CEO Dr. David Ross knows the institution is already a leader in hands-on learning — but he wants to take that to



Photo: SAIT

Dr. David Ross, Calgary Mayor Naheed Nenshi and Students Association President Gar Gar display some of the items buried in a Time Capsule.

the next level. SAIT's 2015-2020 Strategic Plan — Think Big. Think Applied Education outlines the path forward. Key performance drivers include:

- **Setting the standard for academic excellence.**
- **Focusing on an engaging learner experience.**
- **Delivering market-focused services and access.**
- **Building community connections.**
- **Improving processes and infrastructure.**
- **Recruiting high-performing instructors; many of whom have industry experience.**

SAIT alumni say what they enjoyed most about their SAIT education was the smaller class size: 1:20 faculty-student ratio. Another is the outstanding relationship between industry, instructors and students.

**“ Applied education offers students the chance to graduate not only with the theoretical knowledge which often has been the basis for most credentials – but also the practice. Our students take the information learned in the classroom and practice it before they leave. The result of that combination is a very valuable graduate. ”**

**Dr. David Ross** President and CEO SAIT

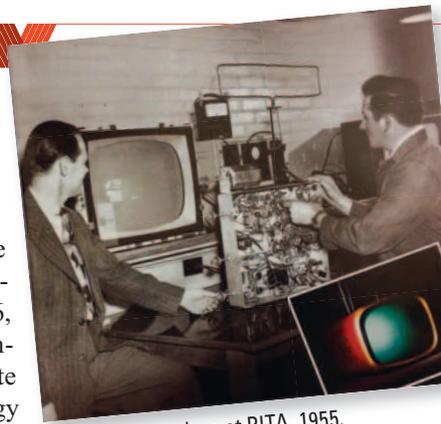
## SAIT looking back

At the time of its founding in 1916, the Provincial Institute of Technology and Art (PITA) was

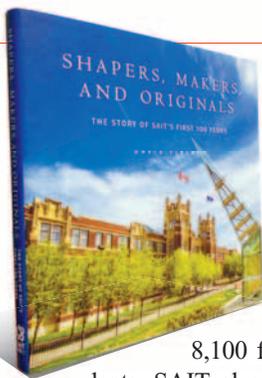
Canada's only publicly-funded technical institute. Just two years later, the country would begin to make the needed social adjustments following the end of World War I. Uniquely qualified, PITA was engaged in training returning soldiers. The Institute moved to its present-day SAIT campus overlooking downtown Calgary in 1922 with the completion of a three-story red brick and sandstone building—now known as Heritage Hall. Heritage Hall was designated a provincial historic resource in 1985 and a national historic site in 1989.

Shortly after the outbreak of World War II, PITA began delivering courses under the Federal War Emergency Training Program. Classes ran around the clock to accommodate regular students as well as vocational training for the armed forces. In 1940, PITA's facilities were used by the Royal Canadian Air Force and served as the No. 2 Wireless Training School for the Commonwealth Air Training Plan. Classes resumed on campus in 1946, followed by infrastructure and enrollment growth to meet the need for a skilled workforce. Apprenticeship training began in 1948, with 42 apprentices enrolled in auto body repair. Eight years later, 1,710 apprentices were enrolled in six programs. In 1960, PITA was renamed the Southern Alberta Institute of Technology (SAIT). During the 1988 Winter Olympics, the SAIT student residence housed athletes and games officials from around the world. Many SAIT staff and students were involved as volunteers with the Olympics and received a unique practical learning experience.

In 2003, SAIT became a founding member of Polytechnics Canada [www.polytechnicscanada.ca] and was rebranded as SAIT Polytechnic in 2004. On Sept. 5, 2012, SAIT officially opened the 740,000 sq. ft. Trades and Technology Complex, which consists of three award-winning buildings - the Aldred Centre, Cenovus Energy Centre and Johnson-Cobbe



First TV repair class at PITA, 1955.  
Photo: SAIT



Energy Centre. The \$400-million expansion project was the largest in SAIT's history, adding capacity for an additional 8,100 full- and part-time students. SAIT alumni and staff, industry, and generous philanthropists who understood the value of a high-technology, business focused applied education, and career-ready graduates contributed to this expansion. There are over 220,000 alumni employed in every region of the world. Demand for SAIT's innovative approach to applied education continues to grow.

In this its centennial year, SAIT Polytechnic in addition to numerous events, published a commemorative book *Shapers, Makers, and Originals* authored by Historian David Finch. Available from the SAIT bookstore this 154-page book provides a wealth of material and archival photographs of the Polytechnic. ■

## Advanced education in Alberta Integrated approach creates collaboration

Alberta Advanced Education [[www.eae.alberta.ca/ministry/about.aspx](http://www.eae.alberta.ca/ministry/about.aspx)] focuses on the province's adult learning programs which include twenty-six post-secondary institutions, apprenticeship and industry training, community adult learning, and student-aid programs. The diversity of education options removes barriers and unleashes the potential of all citizens, making Canada strong and competitive in today's global environment and making the world a better place for all. Education ensures that the Canadian workforce is current, highly-skilled and productive; creating engaged, empowered and socially-conscious citizens who contribute to their communities and the world.

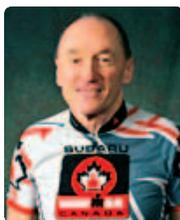
One example of the collaborative nature of post-secondary learning is a new and innovative approach to inter-professional education between University of Calgary medical students and SAIT medical sonography technology students. In an afternoon session students from both institutions interacted and learned from each other. In particular this approach breaks down barriers that commonly exist in the medical system by facilitating communication and in the end improves the patients experience and outcomes during their medical treatment. It is hoped that this type of learning can be expanded to other programs and be mutually beneficial to both institutions.

## Continuous University and Polytechnic Education: A Personal Journey to Success

Education has been a passion of mine throughout my career and has resulted in a life journey for which I have no regrets and a legacy that I take pride in.

Elementary, junior and high-school education in Calgary followed the traditional practices of the time that focused on broad-based, timeless and essential learnings for life. Government examinations were required for graduation from Junior and Senior High School. Recognizing the value of post-secondary education the chosen provider was the University of Calgary and after multiple re-examinations I was able to increase my high-school grades to the minimum level for admission. Working during the summers at a local golf course provided funds for tuition and left a little money over to travel to England and Europe several times as an energetic, adventurous and curious solo vagabond; experiencing and learning from other cultures.

Once graduating from University with a B.Sc. again with the minimum grade point average I was the beneficiary of a fortuitous event—the opening of the University of Cal-



Terrance Malkinson  
[malkinst@telus.net](mailto:malkinst@telus.net)

gary's Faculty of Medicine. With nothing more than a general inquiry as to whether there might be employment opportunities for someone like myself. I received an immediate offer of employment which began a 26-year career, starting as a technician and advancing to the most senior position on the technical career ladder in basic and applied medical research. Looking back, I was extremely fortunate to be supervised by professionals who so clearly understood the nuances of research and mentored me on how to be successful. They were also very gifted research leaders allowing me the freedom to pursue scientific investigation unencumbered, resulting in many significant advances in scientific knowledge and receipt of numerous awards. I continued my pursuit of continuing education in the evenings taking a plethora of programs. These included university, and polytechnical programs in Calgary and at institutions such as the Massachusetts Institute of Technology, and the University of California to name but a few.

Then in 1998, the provincial government became obsessed with deficit reduction resulting in the abolishment of many positions in the public sector and I was one of the victims of what has proven to be disastrous public policy. This was a very difficult time to suddenly lose a job that I was very good at, be separated from associates that were important to me, and with little prospects of employment at the age of 50. However believing in myself I saw this as an opportunity to pursue activities that I had sacrificed in my early years. One of these was particularly life-changing; participation in Outward Bound Canada leadership development programs which brought my life back into focus. I completed an applied Degree in Information Technology from SAIT Polytechnic. Once again upon graduation I was the beneficiary of a fortuitous event—employment with General Electric, an awesome and demanding organization. Again, I was fortunate to have the benefit of an excellent supervisor who believed in me.

Upon my choice to take early retirement my passion for self-development through continuing university and polytechnical education continues, as well as mentoring the next generation through example, discussion and as a philanthropist funding a number of annual and legacy student awards at SAIT Polytechnic. My interest in research continues to

*(Continued on page 24)*

## AltaLink donates power system simulator to SAIT

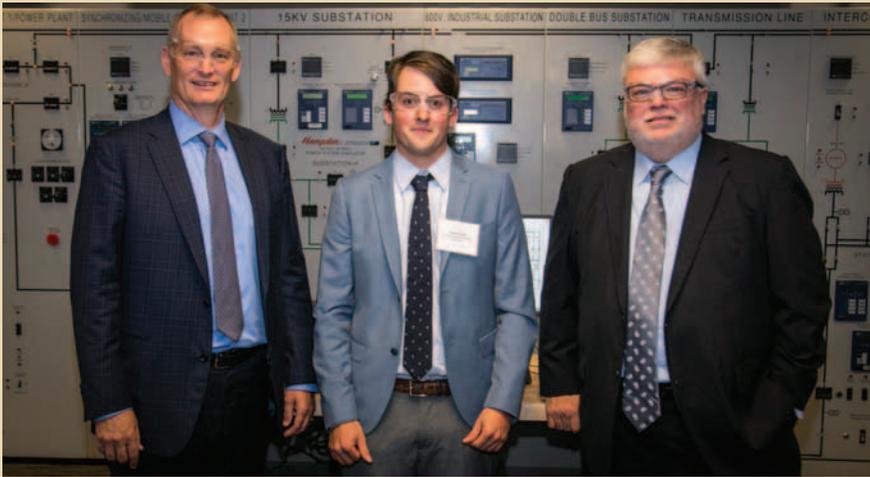


Photo courtesy: AltaLink

(L to R) Scott Thon, President and CEO of AltaLink; SAIT Electrical Engineering Technology student Braden Hanna; and Dr. David Ross, SAIT President and CEO; pose in front of SAIT's new leading-edge power system simulator funded by AltaLink.

One of many examples of the importance that industry has to SAIT graduates is a recent (September 15, 2016) \$760,000 donation by AltaLink that makes possible a new learning tool for Electrical Engineering Technology students. A new leading-edge power system simulator funded by AltaLink, provides a unique learning experience for students, giving them an unprecedented career-ready experience.

"It's another first for SAIT," says Dr. David Ross, SAIT President and CEO. "AltaLink is a tremendous partner who believes in action-based learning. Thanks to them, this generous gift will help ensure our students have relevant job experience that gives them a competitive advantage. With the power system simulator our graduates will be career ready with the skills today's industry demands."

By modeling the management of electricity from a variety of energy sources including wind, solar, natural gas, coal and nuclear, students are able to simulate various electrical scenarios. Using realistic and real-time scenarios, the simulator and supporting curricu-

lum teaches students how to expertly deliver power to industrial, commercial and residential consumers in a way that's safe and cost effective. Additionally, students will be able to simulate the incorporation of intermittent, renewable sources of generation, like wind and solar, while maintaining grid stability.

"We couldn't be more pleased to be able to support SAIT's students and prepare them for a career in the electrical industry," said Scott Thon, President and CEO of AltaLink. "As our province shifts to a greener future, technology such as the AltaLink power system simulator will help us understand how the grid can enable our transition to renewables and position our province as a leader in the energy sector."

The AltaLink simulator is housed in SAIT's MacPhail School of Energy — the first school of energy in Canada and one of only a handful of energy schools in North America. The power system simulator is added to SAIT's roster of high-tech, hands-on learning tools, which includes printing, drilling, crane and health care patient simulators.

*(Continuous University... cont'd from page 23)*

this day with self-funded basic and applied research projects and achieving a current lifetime total of 550 earned peer-reviewed original publications. Maintaining health and wellness is a critical factor to good aging and I engage in exercise daily having completed eleven Ironman Triathlons.

Aging brings wisdom, and reflection on what is important in life. What I have learned is the importance of a broad-based University and polytechnical education and a diversity of life experiences. Believing in

one-self and having the strength, courage and determination to determine and follow your own path. I am incredibly grateful to those individuals who made the choice to believe in me. I certainly recognize the beneficial knowledge diversity obtained through both a university and polytechnical education. This was not the easy path that resulted in financial wealth; but rather a path to a complete life and when this life nears its end a sense of satisfaction and a legacy of contributions that have made the world hopefully a slightly better place. ■

*(University of Calgary cont'd from page 21)*

the first President and Vice-Chancellor of the University of Calgary on April 16. The President held a strong belief that "although the university is accountable to the society that supports it, the university must insist on playing a leadership role in intellectual matters if it is to be worthy of the name."

Today the University of Calgary attracts and nurtures talent that drives new knowledge creation, improves lives and betters our world. In this rich learning environment, the university serves over 31,000 students in more than 200 undergraduate, graduate and professional degree programs, and provides the community with diverse lifelong learning opportunities. International study, volunteer, work, and research programs provide global context while promoting diversity and excellence in learning, teaching and research.

The University of Calgary is Canada's leading next-generation university – a living, growing and youthful institution that embraces change and opportunity with a can-do attitude. Located in an entrepreneurial city, the university has a clear strategic direction – Eyes High [[www.ucalgary.ca/eyeshigh](http://www.ucalgary.ca/eyeshigh)] – to become one of Canada's top five research universities grounded in innovative learning and teaching and integrated with the community. The Strategic Research Plan [[www.ucalgary.ca/research](http://www.ucalgary.ca/research)] identifies three major priorities that will guide the university towards its goal: 1). matching University strengths with opportunities, 2). increasing its research capacity, and 3). creating a dynamic research environment to promote research excellence.

As a comprehensive academic and research institution, the University of Calgary inspires and supports discovery, creativity and innovation across all disciplines. Through the new Taylor Institute for Teaching and Learning, the university is a leader in educational innovation by researching the most effective methods for engaging students and by supporting faculty to be the best teachers they can be. ■

### Acknowledgements

The author is extraordinarily grateful to the following individuals and groups who contributed to the SAIT Polytechnic section of the article: Cathy Downey SAIT's Centennial Project Director; Ashley Kascak Content Specialist, Centennial Project, Communications and Marketing, Karly Sawatzky SAIT's Archivist, the staff of SAIT's Reg Erhardt Library and SAIT's Alumni and Fund Development Office.

# Canada's Technology Access Centres (TACs)

Accelerating innovation through industry partnerships with colleges, polytechnics and cégeps

By **Maike Luiken**  
IEEE Canada President-Elect, 2016-17

**T**echnology Access Centres foster innovation and strengthen competitiveness in Canada from coast to coast. Since 2012 NSERC has been partially funding TACs at Colleges and cégeps across Canada. TACs provide ready access for industry, most often in close geographical



Photo: Lambton College

proximity to a TAC, to specialized technology, equipment, and expertise—particularly small- and medium-sized enterprises (SMEs)—with the goal of enhancing their ability to increase productivity, competitiveness and innovation. And, of course, there are the opportunities for students to participate and gain experience in real-world work projects.

The concept for the TACs is based on the successful Centre collégial de transfert de technologie (CCTT) model developed over the past few decades by the Government of Québec.

TACs provide capabilities and capacity that serve their local/regional companies' innovation needs. They help businesses advance their services,

## TACs aim to help build resilient regional economies.

processes and products. This may include advice on specific company challenges, specialized technical assistance, collaborative applied research and development projects focused on the companies' agendas. Another form of service is specialized training, often related to new types of equipment and processes.

Currently, there are 30 TACs across Canada; more are expected to be founded in the coming years.

TACs strive to be a one-stop-shop and—in addition to the services provided in-house—connect companies to services not offered by a TAC such as additional sources of advice, service, expertise and funding. They are regional innovation hubs for particular sectors/clusters and encourage industry to gain access to advanced technologies, equipment, services and expertise, and innovation support services delivered by college faculty, staff and students that they would not typically be able to access due to financial constraints or internal resources.

The SAIT Green Building Technologies (GBT) and the Institut du véhicule innovant (IVI) at



Photo: Red River College

Cégep de Saint-Jérôme are but two of them: for a complete list with links, please, refer to: <http://tech-access.ca/en/members/>

The current TACs serve the research and innovation needs of a specific regional economic cluster representing nine technology sectors: Advanced manufacturing, Agriculture, Construction technology, Digital media and graphic communications, Environmental technology/biotechnology, Food technology, Healthcare technology, Nanotechnology, Transportation.

In 2015, the TACs formed Tech-Access Canada. Its website provides always-current information and access to the TACs: <http://tech-access.ca/> ■

***Maike Luiken** is President of Luiken International Consulting. She was Director, Bluewater Technology Access Centre at Lambton College until November 2016. Previously she was responsible for the facilitation and management of all applied research projects at the college, comprising small to multidisciplinary inter-organizational, multiyear research projects spanning multiple disciplines from technology to health.*

*Dr. Luiken spearheaded establishment at Lambton of the first NSERC Industrial Applied Research Chair for Colleges. Prior to joining Lambton College, she was Vice-President Research Alliances, National Capital Institute of Telecommunications (NCIT), Ottawa. At NCIT, Maike founded and led the Ottawa Photonics Research Alliance (OPRA), and cofounded the Ottawa Wireless Research Alliance (OWRA).*

## A salute to Terry Malkinson: 50 issues!

**W**ith issue 77 of the *IEEE Canadian Review*, Terry Malkinson, reaches his own milestone as the longest, regularly contributing Associate Editor to the magazine. This is the 50<sup>th</sup> issue to which Terry has contributed, and we are privileged to enjoy both of his usual columns as well as the preceding pieces on the anniversaries of Southern Alberta Institute of Technology (SAIT) and the University of Calgary.

In an accompanying article, Terry chronicles his personal journey reflecting on the value of a polytechnic education and the importance of continuing learning, as his career evolved. Passionate about life-long learning, Terry is now retired, but continues to take both university level and polytechnic courses for interest.

In his regular columns Engineering Management and Biztech (formerly known as a View from the West), Terry piques readers' interest with his reviews and brief synopsis of relevant, current articles in main-stream business magazines.

Not only has Terry written his regular columns, he has also provided several articles over the years. His wide ranging knowledge, and broad experience are reflected in the variety of

topics he has covered, from Futurology to Sports Medicine to Engineering Advocacy.



Terry doesn't only talk and write about exercise, he lives it! A fitness and exercise enthusiast, he has combined his knowledge of engineering and passion for exercise in articles on Engineering and Concussions (issue 66) and the Application of Engineering to Bicycling (issue 59). Terry is an accomplished triathlete who has participated in many Ironman competitions, and enjoys cycling through the streets of Calgary. ■

Ottawa's Beechwood Cemetery honours many of the famous Canadians interred there with a plaque. But, there was none for General A.G.L. McNaughton ...

Photos by Kris Hatashita

## McNaughton Plaque Dedication Ceremony

Procession to plaque site led by piper, Dave Kemp and Andrew Leslie

A stroll through Beechwood Cemetery in Ottawa three years ago by IEEE Canadian Foundation (ICF) President David Whyte led to a destination finally reached on October 16, at 1:00 p.m.

Designated as the National Cemetery of Canada, Beechwood's Famous Burials include such notables as scientist Sir Sandford Fleming, poet Archibald Lampman, and politician Tommy Douglas, the latter widely credited with being the father of

medicare in Canada. General A.G.L. McNaughton is also interred there.

But what Mr. Whyte discovered is that while some of the Famous Burials, such as the aforementioned three, are honoured with a Great Canadian Profiles plaque, General McNaughton was not. A call to Dave Kemp, IEEE Canada History Committee Chair and ICF V.P. Grants quickly followed. The path to a plaque was there, but it would take time and effort. History committee

volunteers were contacted. Plans were made.

By late October 2015, Mr. Kemp was able to report the plaque was installed, and began building a team for a dedication ceremony. Ottawa Section volunteers joined the effort.

The morning of October 16, 2016 was clear and sunny. The afternoon was not. Inside the Reception Centre at Beechwood Cemetery though, the atmosphere was celebratory. The facility's decor gives a sense of both dignity and warmth—some of the character traits of the General those connected to him were to speak of. For an overview of his career, please see the sidebar at top-right of the next page.

A kite caught in a tree does not usually call for the expertise of a general. But if you are the grandson of A.G.L. McNaughton, you might be so lucky. After an engaging introduction by Master of Ceremonies Kemp, this was

the story told by guest speaker Honourable Andrew Leslie, MP for Orléans, former Canadian Forces Lieutenant-General. Apparently the very young Andrew's kite was rescued by the General with the aid of a cross-bow fashioned from an old bed spring, a car strut and a length of piano wire. Left in the youngster's hands, the "weapon of mass destruction" was leveled at numerous targets in the neighbourhood—without success—until "duly confiscated."

The Honourable Leslie paid tribute to his grandfather's "extraordinarily active mind" as a scientist, engineer and inventor, and his "fantastic" interpersonal skills. He noted how they both were Canadian Army Commanders, but observed that his challenges with respect to the war in Afghanistan paled in comparison to those of A.G.L. McNaughton during WWII.

A message from the Honourable Harjit Sajjan, Minister of



Witold Kinsner, IEEE Canada President 2016-17, addresses the gathering.



L to R: Brigadier General Peter Holt (Retired); Honourable Andrew Leslie, MP for Orléans, Cdn Forces Lieutenant-General (Retired); Helen Leslie



Honourable Andrew Leslie reads aloud the inscription on the plaque.

Defence was read out by MC Kemp, which says, in part, “As someone who has served in uniform and now serves as Minister of National Defence, I have a profound respect and appreciation for all of his [McNaughton’s] professional accomplishments and achievements ... His accomplishments are truly remarkable and an inspiration to those around him including his grandson, Lieutenant-General Andrew Leslie.”

Another guest speaker at the event was Jon Jennekens, who served as President of the Atomic Energy Control Board (AECB) from 1978 until 1987. He joined the organization in 1961, the same year that Chalmers J. MacKenzie retired as AECB President. Mr. MacKenzie succeeded McNaughton, who was the organization’s first president. The two were close friends, with MacKenzie later sharing many memories of McNaughton with Mr. Jennekens.

McNaughton’s appointment as Canada’s representative to the short-lived United Nations Atomic Energy Commission (UNAEC) was noted by Jennekens. Founded in 1946, the UNAEC was unable to get all the permanent members of the Security Council to come to a common position on nuclear disarmament. McNaughton was later appointed permanent delegate of Canada to the United Nations and a representative of Canada on the Security Council in 1948.

In introducing guest speaker John Hendrik Swettenham, MC Kemp explained the special role John Swettenham Senior’s three-volume biography of General McNaughton has played within IEEE Canada. It has been the tradition to provide a copy to McNaughton Resource Centres on Canadian campuses when they are first established. Incoming IEEE Canada Presidents are also furnished with a copy of the set.

## A.G.L. McNaughton (1887-1966): engineer, soldier and statesman



Major-General Andrew George Latta McNaughton. Credit: Vandyk Ltd./ Library and Archives Canada/PA-034110

**B**orn in 1887, McNaughton studied at McGill University, in 1912 completing his Master’s of Science degree with Honours in Electrical Engineering. Working as a consultant before the start of WWI, he published six papers on high voltage electrical phenomenon. In 1914 he enlisted as a militia officer, commanding gun batteries. Employing his engineering mind, he optimized triangulation data from the sound and flash of enemy artillery in accurate survey schemes. His results were extraordinary. Using the techniques he pioneered, Canadian counter-battery destroyed more than 70 percent of the opposing artillery in the week prior to the Battle

of Vimy Ridge. By the end of the war, he was in charge of all heavy artillery and counter-battery forces of the Canadian Corp.

Joining the regular army in 1920, McNaughton was rapidly promoted, becoming Chief of the General Staff in 1929, holding that position until 1935 when he was appointed President of the National Research Council. It was during the early to mid-1920s he developed a working model of a cathode ray detection finder—the direct forerunner of radar.

McNaughton had various commands in WWII, then was appointed Minister of Defence in 1944. Following the war, he was appointed Canadian Chairman of the Canada-United States Permanent Joint Board on Defence, and in 1946 became Canadian representative to the United Nations Energy Commission and head of the Atomic Energy Control Board of Canada. In 1948, McNaughton was appointed permanent delegate of Canada to the United Nations and Canada’s security council representative. He became a Commissioner of the International Joint Commission in 1950, and shortly after, named its Canadian Chairman, evaluating amongst other projects development of the St. Lawrence River for navigation and power.

A more full account of Andrew McNaughton’s remarkable contributions can be found on-line in Issues 9 and 10 of the *IEEE Canadian Review*, in a two-part piece by Ted Glass. Mr. Glass skillfully condensed John Alexander Swettenham’s three-volume biography *McNaughton*.

Out of print for quite some time, it has been a challenge to source them. Print-on-demand publishing will make it possible to maintain this honoured tradition.

Contacted last spring by IEEE Canada immediate Past President Dr. Amir Aghdam, who is leading the *McNaughton* reprint initiative, John Swettenham Jr. has offered to write a new foreword to the three volumes. Mr. Swettenham recounted his experience meeting A.G.L. McNaughton as a three-year-old, and then offered his views on how the General would appraise Canada’s performance and priorities in a number of areas, were he alive today. Swet-

tenham currently is Chief Marketing Officer for the Canadian Museum of Nature. He previously led marketing at Canada Post.

In introducing University of Ottawa Student Branch Chair Danielle Marchand, MC Kemp conveyed the excitement within the ICF on the expected 40<sup>th</sup> McNaughton Learning Centre to open soon. The ICF supports creation and maintenance of the McNaughton Centres by way of approval of grant applications.

The benefits of a McNaughton Centre to a Student Branch were articulated by Ms. Marchand with a rich array of examples.



L to R: Scott Melvin, IEEE Canada Secretary; Xavier Fernando, IEEE Canada Central Area Chair; Amir Aghdam, Immediate Past President, IEEE Canada; Janet Davis, IEEE Ottawa Section Chair



L to R: Luc Matteau, Treasurer, IEEE Canadian Foundation; Kash Husain, IEEE Canada Administrator; Rana Husain, IEEE Canada Administrative Assistant; Raed Abdulla, IEEE Ottawa Section Chair 2009-2010.

“They harbour many academic events and workshops,” Marchand explained, “broadening students’ familiarity and competency with different technologies.” Marchand cited Arduino workshops, raspberry pi workshops and programming workshops as examples of events hosted at the University of Ottawa Centre. Students use the resources there both for academic projects and some just for pure interest’s sake, she says.



Danielle Marchand, University of Ottawa, IEEE Student Branch Chair

Marchand offered some insights on the role of the Learning Centres in inspiring students to take on roles beyond those their formal education prepares them for. “They are a place where teamwork and leadership grow, where students learn the basic soft skills that are needed to become, hopefully, one of the many great things General McNaughton was: an engineer, cabinet minister and diplomat — just to name a few. As the Centres grow, his legacy also grows.”

IEEE Canada President Dr. Witold Kinsner then offered a unique perspective on the establishment in 1979 of the first McNaughton Centre by then Region 7 Director Ted Glass at the University of Winnipeg, where Dr. Kinsner has taught since 1970. Picking up on Marchand’s remarks, he noted how McNaughton and his contemporaries fought real wars, but also fought for the hearts and minds of others. For him, McNaughton has never departed, “but is still with us in the hearts and minds of young people.”

In concluding the proceedings in the reception area, MC Dave Kemp thanked his co-planners in organizing the day’s activities: IEEE Canada Administrator Kash Husain; Janet Davis, IEEE Ottawa Section Chair; Raed Abdulla, IEEE Ottawa Section Chair 2009-2010.

With the addresses complete — and the rain abated — the gathering wound its way led by piper through Beechwood’s picturesque lanes to the site of the plaque, where MC Dave Kemp unveiled it, and read aloud its inscription in English. The Honourable Leslie read aloud the French version, both keeping an eye on the clouds. Then, all were piped back to the Reception Centre, making the last leg of this most successful journey in duly honouring the legacy of A.G.L. McNaughton at the National Cemetery of Canada. ■

## John Swettenham Jr. and McNaughton



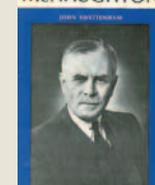
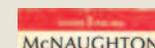
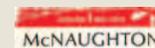
It’s not every three-year-old that gets to shake the hand of a famous general. Or an eminent scientist. Or an esteemed statesman. But when

John Swettenham Jr. was introduced by his father to Andrew George Latta McNaughton, the young lad accomplished them all.

“You’re going to meet a great man,” the tot was told by John Swettenham Senior, author and biographer. “I want you to remember this.” Fifty years later, the now-adult John Swettenham Jr. fondly recalls the occasion with ease. And to historians – and to members of IEEE Canada – those words of respect ring as true today as they did back then.

John (Jr.) Hendrik Swettenham shared this delightful story both at the Great Canadian Profiles plaque unveiling in Beechwood Cemetery on

John Hendrik Swettenham will be writing the foreword for the on-demand reprint of his father’s three-volume biography of General McNaughton.



October 16, and also with members of the IEEE Canada Board earlier that day. In presenting to the Board, Mr. Swettenham kindly passed around his personal copies of John Alexander Swettenham’s *McNaughton Volumes*.

He also offered an interesting analysis of how McNaughton would react to three engineering-related areas: the high-tech revolution, infrastructure investment and climate change. His assessment of what McNaughton would prescribe for Canada’s challenges today?

- Think positive and BIG
- Take an engineering approach
- Have confidence in being Canadian. ■

# IEEE Canadian Foundation

**F**ROM THE PRESIDENT—We want to thank you again, and recognize your support to the IEEE Canadian Foundation in 2015. Our generous donors pay forward to programs that benefit present and future electrical engineers and engage IEEE technical expertise to provide humanitarian benefit to society.

Your gifts allowed us to enhance the learning experience for electrical, electronics and computer engineering students across Canada with our programs of McNaughton Centres and Scholarships.

Students and other recipients also benefit through the co-funding of special projects that develop engineering enthusiasm and skills at all levels. Increasingly, these projects use technology for the benefit of humanity. “Success Stories” both on our website and in this magazine demonstrate the wide range of technical and professional and development opportunities that we support, all derived from the required Project Completion reports which are reviewed from all Special Grant recipients.

Our General Fund is crucial to our ability to operate each and every year, and your undirected donations allow us to keep our base strong.

Our Endowed Funds support a wide range of awards, prizes and scholarships. Please consider a directed donation to endow an IEEE Canada award or create a new award of your choosing.

Gifts may be designated to any one of the following funds of the IEEE Canadian Foundation.

- **General Fund** – supports IEEE McNaughton Learning Resource Centres across Canada, related Scholarships, and Special Grants
- **Canadian Life Members Fund** – supports activities of interest to Life Members, potential engineers, and engineering students
- **Technology for Humanity Fund** – supports new and innovative projects that seek to apply technology for the benefit of humanity.
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- **\* Raymond D. Findlay Annual Undergraduate Scholarship** – supports a national scholarship recognizing leadership and professionalism

- **The IEEE Canadian Foundation Robert T.H. Alden Scholarship** – awarded to an IEEE student member within the Toronto Section.

We appreciate your past support and urge you to continue to do so and increase your contributions where possible. If you have not yet made a donation, please join your peers— this is your opportunity to stand with others who choose to make a difference. We could do so much more with your financial support. All the different ways to give and donor recognition programs are fully described on our website.

The IEEE Canadian Foundation wants to hear from you – if we can better engage and support our community, please let us know. ([president@ieeecanadianfoundation.org](mailto:president@ieeecanadianfoundation.org), [president@ieeefoundationcanadienne.org](mailto:president@ieeefoundationcanadienne.org)).

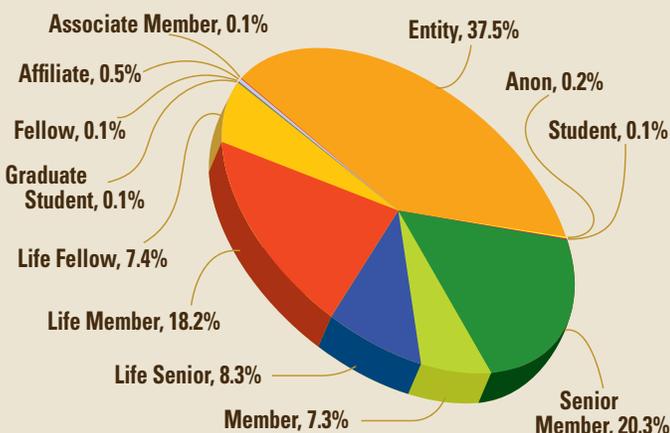
Many IEEE members in Canada contribute to the all-volunteer effort that is the IEEE Canadian Foundation, including the invaluable assistance of Luc Matteau, John Mowbray and many others in the preparation of this 2015 Honour Roll of Donors.

Yours sincerely,

**David H. Whyte**  
President, IEEE Canadian Foundation

\*New in 2016

## 2015 DONATIONS BY SOURCE



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(7 upgrades and 1 new centre at University of Windsor)

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Every gift makes a difference. The honour roll formally recognizes all donors contributing \$25 or more. The foundation extends our thanks also to those donors who are not listed.



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\* This Gift from the Newfoundland and Labrador Section is targeted toward its Section IEEE Student Night awards, given for achievement in capstone projects at Memorial University each March.

# Fondation canadienne de l'IEEE

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**OT DU PRÉSIDENT**—J aimerais vous remercier à nouveau et reconnaître le soutien que vous avez apporté à la Fondation canadienne de l'IEEE (FCI) en 2015. Par vos dons généreux, vous rendez possibles des programmes destinés aux ingénieurs électriques d'aujourd'hui et de demain qui engagent l'expertise technique de l'IEEE dans le but de procurer des bénéfices humanitaires à la société.



Vos dons nous ont permis d'améliorer l'expérience d'étudiants en génie électrique, en génie électronique et en génie informatique grâce aux programmes de nos Centres McNaughton, situés dans des établissements partout au pays, et à nos bourses.

Des étudiants et d'autres bénéficiaires ont également profité du cofinancement de projets spéciaux qui nourrissent l'enthousiasme et développent les compétences en ingénierie à tous les niveaux. De plus en plus, ces projets utilisent la technologie pour le bien de l'humanité. Les histoires de réussite publiées sur notre site Web et dans cette revue démontrent le vaste éventail d'occasions de perfectionnement technique et professionnel que nous soutenons, toutes tirées des rapports d'achèvement des travaux soumis à notre attention par les bénéficiaires de subventions spéciales.

Essentiel à notre fonctionnement année après année, notre Fonds général est constitué de vos dons à usage non déterminé. Nos Fonds dotés permettent d'accorder un grand éventail de prix et de bourses. N'hésitez pas à faire un don déterminé pour financer un prix d'IEEE Canada ou créer un nouveau prix de votre choix.

Vous pouvez également contribuer à financer l'un des fonds suivants de la FCI :

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- **\* Fonds de chercheurs-boursiers en informatique des cycles supérieurs Nick Cercone de la Fondation canadienne de l'IEEE** – finance les bourses d'études en informatique, un domaine d'études cher à l'IEEE;

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J'apprécie votre soutien et vous invite à maintenir vos contributions, voire à les augmenter, dans la mesure du possible. Si vous n'avez pas encore fait de don, n'hésitez pas à imiter vos pairs – vous avez là l'occasion de faire, avec d'autres, un geste concret pour changer les choses. Nous pourrions faire tellement plus avec votre appui. Reportez-vous à notre site Web pour connaître les différentes façons de donner et en savoir plus sur notre programme de reconnaissance des donateurs.

La Fondation canadienne de l'IEEE cherche sans cesse à mieux soutenir sa communauté et accepte donc avec plaisir tous les commentaires et propositions à cet égard. (president@ieeecanadianfoundation.org, president@ieeefondationcanadienne.org).

De nombreux membres de l'IEEE au Canada consacrent généreusement une partie de leur temps à la Fondation canadienne de l'IEEE. Nous sommes notamment reconnaissants à Luc Matteau, à John Mowbray et à plusieurs autres pour la préparation de cette liste d'honneur des donateurs 2015.

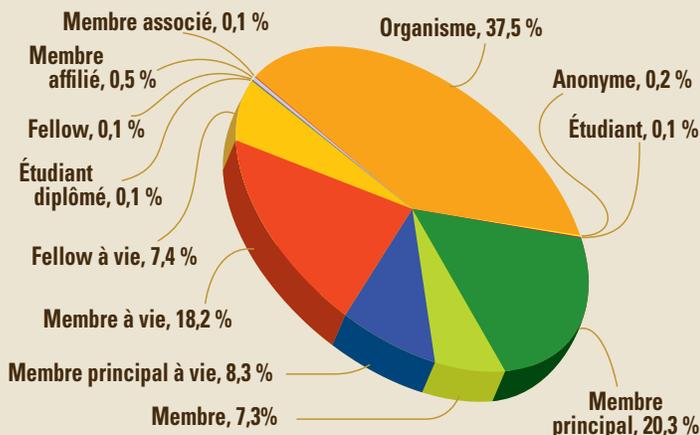
Veillez agréer mes meilleures salutations,

**David H. Whyte**

Le président de la Fondation canadienne de l'IEEE

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## En 2015, les contributions des donateurs ont aidé à soutenir:

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Chaque don compte. Le Tableau d'honneur reconnaît officiellement tous les donateurs ayant versé 25 \$ ou plus. La Fondation tient à remercier également tous les donateurs qui n'y figurent pas.



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# 2016 IEEE Canada Electrical Power and Energy Conference (EPEC)

Fifteen years after this now national IEEE Canada conference began as an Ottawa symposium, a formidable organizing team gives it their best again

**H**eld on October 12-14 in Ottawa, EPEC 2016 brought attention to new concepts and technologies that are being developed, deployed, and integrated in the evolving power system. A concept explored in detail was Smart Grid, which merges together many hi-tech and traditional power engineering disciplines to a degree inconceivable only a few years ago. This is a fundamental aspect of grid modernization and of the integrated power system of the future. At the same time, the power system must remain robust, reliable, efficient, and cost-effective. With the theme *Smart Grid and Beyond: Future of the Integrated Power System*, EPEC 2016 embraced these extraordinary opportunities and challenges.

The venue for the event was Ottawa's Shaw Centre. Featuring sweeping expanses of glass and steel, its futuristic architecture was in phase with the conference's forward-looking theme. Lunch and break service under the glass dome and natural light created a very positive atmosphere.

EPEC 2016 showcased four keynote presentations, 122 peer-reviewed technical papers (out of 198 initial submissions), 19 industry presentations, three industry panels, an industry course, a workshop, three tutorials and 12 exhibitors. The Industry Program (IP) was shaped up by the IP Committee in conjunction with the Technical Program Committee. Having a track specifically targeting industry brought greater participation from that sector. This innovation was particularly successful and signals a likely future direction of the EPEC.

On Thursday morning, The Honourable Sergio Marchi, P.C., President and CEO, Canadian Electricity Association, delivered a keynote "Electricity: A Strategic Asset for a Greener, More Prosperous Future." He emphasized the importance of building tomorrow's economy on a solid foundation of



L to R: Raed Abdullah of Hydro Ottawa, Gen. Conference Co-Chair; Colin Clark, a Conference Honourary Chair and Keynote Speaker; The Honourable Sergio Marchi, a Keynote Speaker; Dr. Branislav Djokic of NRC in Ottawa, Gen. Conference Co-Chair; and Natalie Krauser McCarthy, representing the IEEE PES Scholarship Plus Initiative.

clean, sustainable growth that will drive new technologies, increase productivity, and create good jobs for Canadians. By addressing existing regulatory and policy gaps, Canadian utilities can be incentivized to launch pilot projects and conduct technology trials that will help reduce emissions, increase efficiency and make Canada a leader in the high-margin knowledge-economy.

Mr. Marchi ended on a positive note that the Canadian electricity sector is Canada's clean energy solution, and that by harnessing the power of clean, safe, and reliable electricity, Canada is well positioned to lead. His keynote generated a lot of interest and developed into a lively discussion in which virtually everybody in the audience participated.

At the banquet, Colin Clark, CTO of Brookfield Renewable, gave an outstanding keynote: "Our Heritage and Future in Power: The Evolution and Future of Electric Power Systems." He pointed to electrification as a basis of the progress of mod-

ern civilization, with electric power systems having enabled this remarkable development. Having evolved over many decades, these systems are now accommodating unprecedented change to the methodology for the production of electricity and its delivery to users. This transition is driven by emerging social expectations, environmental standards, economics, and rapid rise of technology, reshaping power systems as we know them. After an insightful account of the evolution of electric power systems, Mr. Clark explored the outlook for the future of the sector that we all depend on.

On Friday, Dr. Tom Murad, Head of Siemens Canada Engineering and Technology Academy, gave an intriguing keynote "Smart Cities – Our Understanding." He elaborated on smart-city and smart-building concepts, and state-of-the-art technology solutions for the benefit of people, administration, business, and environment. He also stressed the necessity of efficient transportation and reliable energy supply in metropolitan areas, the latter complicated by growing energy needs and the fluctuating nature of renewable sources. The presentation caught the imagination of the audience whose numerous questions and answers ran up to the subsequent session.

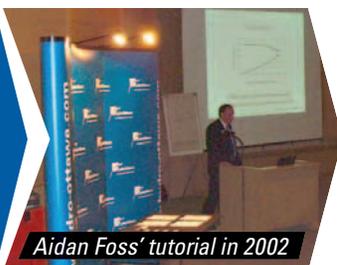
The industry panels were on Hydro Power, moderated by Jean Pellerin of Brookfield Renewable; on Climate Change and Impact on the Industry, moderated by Richard St-Jean of Brookfield Renewable; and on Energy Storage, moderated by Dr. Adam

## A View from Across the Pond

By Dr. Ivana Kockar, Senior Lecturer, University of Strathclyde, Glasgow, UK

**THIS CONFERENCE** was a great opportunity for me to compare issues and solutions related to Canadian grids with the ones in the UK. Currently, I am mainly working on developing new methodologies and tools for the integration of Renewable Generation and Distributed Energy Resources into electricity networks. This is a really complex question that needs to look not only into technical solutions, but also economics/markets, as well as social aspects of engaging with customers. My discussions with a number of colleagues on these topics were really interesting. As someone who obtained a Ph.D. from McGill University in Montréal, a move to the UK provided me with the opportunity to expand my knowledge and learn new approaches to various issues. Thus, it was really great to hear again about approaches to demand-side participation or new techniques/solutions applied here in Canada. At the moment, in the UK, distribution networks are affected by significant penetration of distributed gen-

**EPS/EPEC:**  
Keeping pace  
with the changing  
electrical power  
landscape



Aidan Foss' tutorial in 2002

**T**he Electrical Power and Energy Conference originated from a series of Electrical Power Symposia (EPS) held in Ottawa annually 2001-2006. Subsequently, the conference was held in other cities across Canada. EPEC is now an established international forum (close to 50% of attendees come from outside of Canada) for the presentation of peer-reviewed papers, industry presentations, and other learning opportunities related to power and energy research, development, and applications. It is an exceptional opportunity for experts from academia, industry, government and other organizations from Canada and abroad to get together, and discuss the latest developments, trends, and issues, including those on the potential societal impact. From its beginnings, the conference has been highly responsive to a fast-changing electrical power landscape. The prime driver for the first Electrical Power Symposium was a need to address deregulation and its implementation in the electricity industry in Ontario in 2001. At EPEC 2016, Bashir Bhana, a Planner at the Ontario IESO, gave the first keynote "The Ontario

## Conference Volunteering at Ottawa Section



Photo: Manisha Wanniarachchige

Participants from the WIE Panel, one of three co-located events held the last day of EPEC 2016. *L to R, standing:* <sup>1</sup>Linda Tang, <sup>2</sup>Cheryl Tollola, <sup>3</sup>Manar Al-Shaebi, <sup>4</sup>Geneviève Favreau, <sup>5</sup>Elena Uchiteleva, <sup>6</sup>Dr. Ferial El-Hawary, <sup>7</sup>Dr. Joan Haysom, <sup>8</sup>Dr. Melike Erol-Kantarci, <sup>9</sup>Dr. Ivana Kockar, <sup>10</sup>Rachel Vanasse, <sup>11</sup>Alise Wang, *L to R, sitting:*, <sup>12</sup>Jimmy Deng, <sup>13</sup>Nadisha Wanniarachchige, <sup>14</sup>Anjali Wadhwa, <sup>15</sup>Irem Bor-Yaliniz.

Tuck of NRC. They were well attended and generated a lot of questions and discussions. The conference offered a two-day industry course “Machine Condition Monitoring for Hydro & Turbo Industries” presented by André Tétrault, of VibroSystM, headquartered in Longueuil, Québec. This course was eligible for Continuing Education Units (CEU) registered with the Engineering Institute of Canada, and was valuable both for the attendees, who were mostly from industry, and for the course provider, as per feedback from Marc Bissonnette, Director of Sales and Business Development at VibroSystM. During the workshop on IEEE Smart Grid Standards, presenters and panelists from IEEE Standards Association stimulated lively discussions with attendees. The tutorials encompassed “Business Opportunities Created by Novel Energy Performance Indicator” by Dr. Constantin Pitis, Powertech Labs Inc.; “Introduction to Smart Grid and Distributed Energy Resources Standards by IEEE SCC21” by Mark Siira, ComRent International, and Wayne Stec, Distregen LLC; and “Planning and

Integration of HVDC into the Modern Grid” by Tarek Abdel Galil and Maziar Heidari of SNC Lavalin T&D.

In addition, on Friday the conference hosted three co-located events: a Women in Engineering (WIE) panel, a Special Interest Group on Humanitarian Technology (SIGHT) session, and a joint panel dubbed horizons@EPEC of students, Young Professionals, WIE and SIGHT on “Innovation, Diversity, Sustainability, and Career Preparation.” After an engaging discussion, participants explored employment opportunities over wine-and-cheese with local companies’ representatives.

The IEEE Ottawa Section organizers, including several of the original EPS/EPEC founders, were enthusiastic to host EPEC 2016. Volunteers’ names and roles, and more details on the program, can be found on the conference website (epec2016.ieee.ca).

The organizers extend their thank-you to the sponsors, patrons (Brookfield Renewable, ABB, Carleton University, University of Ottawa, Leidos, and Algonquin College), and exhibitors, whose support was critical for organizing the conference. The thank-you also goes to many volunteers, who dedicated their time and effort over the past two years to make EPEC 2016 a great experience for all. ■

**N.Ed.** Many thanks to all those who contributed to this report, and especially to Dr. Branislav Djokic, Co-Chair EPEC 2016.

### Affiliations of Women in Engineering panel participants:

- |  |   |
|--|---|
| <sup>1</sup> U. of Ottawa, undergraduate student                                     | <sup>9</sup> Panelist; U. of Strathclyde, UK; Sr. Lecturer                                |
| <sup>2</sup> Panelist; VP Academic IEEE uOttawa Student Branch, Ottobatics President | <sup>10</sup> Brookfield Renewable  |
| <sup>3</sup> Carleton U., B.Eng Biomedical & Elect. Engin. Graduate                  | <sup>11</sup> Panelist; EPEC 2016 Patronage Co-Chair; U. of Ottawa, undergraduate student |
| <sup>4</sup> Panelist; Toronto Hydro   | <sup>12</sup> U. of Ottawa, undergraduate Student   |
| <sup>5</sup> Panelist; WIE Chair, IEEE Canada; Western U., Ph.D. student             | <sup>13</sup> Carleton U., undergraduate student  |
| <sup>6</sup> B.H. Engineering Systems Ltd.   | <sup>14</sup> Carleton, U., B. Eng. graduate  |
| <sup>7</sup> Panelist; Leidos  | <sup>15</sup> Carleton U., Ph.D. student  |
| <sup>8</sup> Panelist; U. of Ottawa, Asst. Professor                                 |   |

eration, while in Canada reducing peak demand seems to be the main concern. Yet, there were also similar problems, such as SmartGrids, SmartCities, and TSO-DSO interactions, which are becoming some of the main research and industrial application questions. Chairing a Technical Paper Session at the conference was an excellent way to become familiar with developments on both sides of the Atlantic.

Another great aspect of the conference was participation of the younger generation of engineers that are just starting their career or are at the end of their studies. The Women in Engineering (WIE) organized a session inviting a number of women both from

industry and academia, and at different stages in their careers, to provide some insight into their daily work and place in engineering. Interestingly, none of us even once talked about being a woman engineer – we just talked about how great and rewarding the profession could be, and simply saw ourselves as “engineers.” As a panelist, seeing smiling faces and nodding in the audience was so encouraging and genuinely uplifting. I really hope the audience enjoyed the event as much as the speakers did.

It was really great being back in Canada, which still feels as another home – and the great weather and festival of colours was just a cherry on top. ■

Planning Outlook (OPO): An Illustration of the Changes Taking Place Across Electrical Systems in Canada and the Western Countries.” It nicely reflected on the EPS/EPEC 15-year time distance and provided an informative overview and outlook for Ontario, but also of the issues of national and international relevance.

Dr. Aidan Foss has a unique experience as an EPS founder, and as EPEC 2016 Secretary, Industry Presenter and Exhibitor. He founded two private companies in the electric power field, and EPEC 2016 offered a very good opportunity for presenting his small-hydro controls. “EPEC fills an important gap in the industry,” says Foss.

**“The electrical power industry has been going through major transitions in Ontario since 2001, then evolving throughout Canada. The conference provides an ideal venue for information sharing on leading edge topics, such as renewable energy and smart grids.”**

But increasingly, the conferences’ offerings on world-wide developments are also drawing participants. Dr. Ivana Kockar is now Senior Lecturer, University of Strathclyde, Glasgow, UK. While pursuing her Ph.D. Degree at McGill University, she attended some of the Ottawa Electrical Power Symposia.

“It was great to see that EPEC has grown from the days when I attended it as a student in itself as a regular venue for great discussions. Meeting a number of my colleagues from EU, with whom I have common projects, was just another sign of the EPEC’s growing internationalization.” ■

➤ **The cover story** of the October 29, 2016 issue of *The Economist* “Liberty Moves North” [Vol. 421 #9013. Page 11 and 19-22. [www.economist.com](http://www.economist.com) ] discusses how Canada is uniquely fortunate in many ways and how it provides valuable lessons for other Western countries. Bucking the protectionist trend, characterizing so many other countries, the authors describe how Canada remains as a champion of openness, tolerance, employment opportunities, health care safety nets, stable governments, international free-trade and constructive human migration.

➤ **Jim Lawton describes** how collaborative robots, working alongside humans on the manufacturing floor can be used to automate a large range of production tasks and permit manufacturers to quickly and easily adjust to market demands. [“Collaborative Robots.” *InTech*. 63(5):12-14. Sept.-Oct., 2016. [www.isa.org](http://www.isa.org) ]. The author differentiates between collaborative and traditional robots, discussing their unique features and role in the future of manufacturing.

➤ **Ron Adner and Rahul Kapoor** discuss the difficulty in predicting the timing of technological change and planning an appropriate response strategy to remain competitive. The authors suggest that we are very good at predicting if an innovative technology will supplant an older one but we are not very good at predicting when the transition will take place. They propose a process where you scrutinize not just the old and new technologies but also their “ecosystems” in “Right Tech, Wrong Time” [*Harvard Business Review*. 94(11):60-67. November, 2016. [www.hbr.org](http://www.hbr.org) ]. The authors believe that analysis of the ecosystem dynamics in an industry can help predict the speed of technological change permitting an effective response for long-term survival.

➤ **It is estimated** that one in every 200 people worldwide cannot see and another 246 million have reduced vision. David Dobbs provides insights into medical advances and treatments that are benefiting many who are losing or have lost their eyesight in “A Cure in Sight” [*National Geographic*. 230(3):30-53. September 2016. [www.nationalgeographic.com/magazine](http://www.nationalgeographic.com/magazine)]. Today, replacement of the cloudy natural lens with a clear artificial lens is a ten minute surgery; with an immediate return to clear vision. I have experienced this personally; having undergone corrective bilateral cataract lens replacement treatment a few months ago. No need to be fearful; the surgery is quick and painless. This article provides important



## What's New in the Literature?

by **Terrance Malkinson**



information on diseases that affect the eye, current treatment, and research. The author also discusses the gulf between the developed and developing world in vision care.

➤ **For those of us** in our senior years, the passenger experience for today’s airline customer is much different than that which we “enjoyed” in our younger years. Travel today is stressful in many ways. *Consumer Reports* in its cover story article “Secrets to Stress-Free Flying”. [81(10):18-31. October, 2016. [www.consumerreports.org](http://www.consumerreports.org)] provides strategies to fly saner, safer, and cheaper. Seat size, safety, fares, passenger conflict, connections, airline rankings and booking flights are but a few of the topics covered in this consumer report. An interesting inset describes a few of the initiatives of consumer advocacy groups on airline safety and customer-service..

➤ **Many businesses are** taking on society’s biggest problems and achieving financial success by doing so. Erika Fry and others in their *FORTUNE* article “50 Companies Changing the World: and Making Money Doing It.” [174(3):58-78. September 2016. [www.fortune.com](http://www.fortune.com)] profiles fifty companies that do well by doing “good” globally. Somewhat related to this topic, *MIT Technology Review* profiles “50 Smartest Companies.” [119(4):61-93. July/August, 2016. [www.technologyreview.com](http://www.technologyreview.com)]. These companies are considered “smart” because of the way they create new opportunities; combining innovative technology with an effective business model and taking advantage of new digital technologies.

➤ **Engineering News Record** [277 (8):43-63. September, 2016. [www.enr.com](http://www.enr.com)] reports on the peer-selected winners of the “Global Best Project Awards-2016”. These projects were judged to be the most outstanding examples of the risks, rewards, and hurdles overcome when designing and building internationally. The project winning top honors as global project of the year was the Thames Water Lee Tunnel in the best water/wastewater category. This tunnel was built by an international team to improve water quality in the London, England Borough of Newham and employed innovative management and construction techniques. The 6.9 kilometer long, 7.2 meter diameter tunnel captures overflow storm water mixed with sewage that

was previously discharged untreated into the Thames River. Once storm flows drop, the water stored in the tunnel is sent for treatment. Approximately 35 million metric tons of overflow can be diverted and treated.

➤ **Medical identity theft** is on the rise. This occurs when someone steals personal data to illegally obtain prescription drugs, doctor care or surgery. Should this occur, it can be personally devastating, endangering your medical treatment and finances. In “Body Snatchers”, [*Consumer Reports*. 81(10): 42-49. October, 2016. [www.consumerreports.org](http://www.consumerreports.org)]. Michelle Andrews provides information about who is most at risk, how to lower your risk, spotting the warning signs, protecting yourself, and what to do should you become a victim.

➤ **Karl Deisseroth describes** a new experimental approach using both chemistry and biology that provides scientists with a technology to visually examine the deepest portions of the intact brain in “A Look Inside the Brain” [*Scientific American*. 315(4):30-37. October, 2016. [www.scientific-american.com](http://www.scientific-american.com) ]. This new technique involves removing lipids and replacing them with a substance that allows the investigator to see past the barriers that currently block an internal view of this complex organ. These hydrogel embedding methods allow researchers to examine the wiring of specific neural circuits and are described in a pictorial flowchart. This innovative technique is predicted to give new insights into the biology of the brain and its disorders. and is also now being expanded and applied to other organs and tissues.

➤ **It is estimated** that by 2050 70% of the world’s population will live in urban areas and rail will be the transportation system of choice. Additionally, the rise of the Internet of Things combined with smart cities will increase our reliance on the rail system, and on how modern railways and subways are being constructed. Carlos Gonzalez discusses the future of cities and surface and underground rail transportation in “All Aboard! The Future of Railroads, Subways, and Smart Cities” [*Machine Design*. 88(8):32-38. August, 2016. [www.machinedesign.com](http://www.machinedesign.com)]. ■

For **Terrance Malkinson’s** biography please see page 9.

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