



CASI TORONTO FLYER

JANUARY 2018, Volume 25 #3

Toronto Branch Membership Newsletter

NEWSLETTER LINKS

Click on any of the links below to move to other sections of the Newsletter

[Industry News](#)

[Academic News](#)

[Museum News](#)

UPCOMING CASI EVENTS

Keep an eye on email and social media for information about upcoming CASI Toronto Branch meetings.

SPREAD THE WORD

Help us to publicize our Toronto Branch meetings. Share your meeting notice with friends and colleagues, and post them around your school or workplace.

YOUR NEWSLETTER

The CASI Toronto Flyer brings you local aerospace news. Suggestions and/or contributions are always welcome. If you've been to an interesting lecture or want to see coverage of an aerospace business in southern Ontario, let us know. Contact the Editor, Gillian Clinton, of Clinton Research, at:

gillian@clintonresearch.ca

or

casitorontobranch@gmail.com

CONTACT US

Get in touch with CASI Toronto Branch Executive with questions, comments, suggestions or to volunteer:

casitorontobranch@gmail.com

[Facebook](#) ("CASI Toronto")

CASI website casi.ca/toronto

Executive members plan and run the monthly meetings, connect with GTA aerospace schools, and host the annual dinner meeting.

Our 2017/18 Executives are:

Chairman – Chris Hayball
Vice Chair & 'Flyer' Editor – Gillian Clinton

Councillor – Alex Tsoulis
Treasurer – Bhavik Mody
Education – Yasmin Saeedi
Secretary – Fatemeh Mousavilar

Members at Large:

Amir Masoud Tahvilian
Harshita Patel

UPCOMING EVENTS IN TORONTO



ONTARIO AEROSPACE COUNCIL

Aerospace Public Relations - Think Bucks, Not Just Buzz

With Adam Konowe, VP of Client Strategy at TMP Worldwide

Date: **January 16, 2018**

Time: 8:00 a.m. - 12:00 p.m.

Location: Holiday Inn Yorkdale.

For more information contact natasha.gagnon@theoac.ca.

Registration [available here](#).



Canadian Space
Commerce Association



The **Canadian SmallSat Symposium 2018, February 13 - 15**, is focused on Space Sustainability, in advance of COPUOS' presentation to the United Nations General Assembly in 2018.

SmallSats are a key factor in space sustainably, both in providing solutions and potentially contributing to the problem. As

more are actively using space for security and socio-economic benefits crowding of physical orbital locations and broadcasting interference become a greater concern. The current traffic in LEO and the thousands of smallsats slated for deployment, heighten the propensity for collision and challenge the sustainability space. SmallSats are also a mitigating factor in managing Earth's sustainability issues. Many indicators necessary for environmental observation must be monitored from space, where SmallSats are agile enough to bear the burden. The demand and opportunity to put SmallSat's in orbit is continuing to grow, especially at the micro and nano scale.

To position Canada to provide solutions and technologies to mitigate this concern, the CSCA is bringing together stakeholders from across the country and inviting international participation to provide a forum for discussion and collaboration.

[More information/registration links.](#)

Women in Planetary Science & Exploration (WPSE)

WPSE 2018 is an opportunity for scientists and engineers to showcase their recent findings in the field of planetary science and exploration. The event highlights the achievements of women and non-binary researchers in a range of space-related fields while offering an opportunity to discuss, challenge, network and support their peers.

Supporting #WomenInSTEM is the prime goal of this event.

The event will take place on **February 17 - 18, 2018** at the University of Toronto in the Bahen Centre for Information Technology.

We encourage geologists, geophysicists, engineers, biologists, chemists, physicists, astronomers, and any other people of all genders working or researching in a related field to apply. Of particular interest would be students studying space law, space exploration history, or commercial aspects of space exploration.

More information is available at wpse2018.ca/.

INDUSTRY NEWS

BOMBARDIER

the evolution of mobility

Bombardier and Qazaq Air Sign Order for Two New Q400 Aircraft



TORONTO – December 13, 2017 – Bombardier Commercial Aircraft announced today that Qazaq Air JSC of Kazakhstan has signed a firm purchase agreement for two new Q400 turboprops.

Based on the list price of the Q400 aircraft, the firm order is valued at approximately \$66.8 million US.

“We are delighted that Qazaq Air will continue to grow its fleet with the Q400 aircraft,” said Ryan DeBrusk, Vice President, Sales,

Europe, Russia and CIS at Bombardier Commercial Aircraft. “Since the inauguration of Qazaq Air services within Kazakhstan in 2015, the Q400 has continued to prove itself in their operations and we are excited by this further endorsement of the Q400s superior operating characteristics.”

“We are pleased with the agreements reached on the acquisition of these new aircraft with Bombardier, with whom we have been in partnership since we started the airline,” said Blair Treherne Pollock, CEO of Qazaq Air. “It is thanks to the Q400 aircraft, which Qazaq Air has been operating successfully since 2015, that it is now possible for us to fly our passengers to 15 destinations in Kazakhstan. To date, we have flown more than 420,000 passengers, having shown a 50% increase in passenger traffic in 2017 compared to last year. “Adding two new aircraft to our fleet will not only allow us to expand our route network inside the Republic of Kazakhstan, but also to start new flights beyond it, covering nearby cities in the Central Asian region.”

Bombardier Predicts African Intra-regional Connectivity Will Triple Total Traffic Growth in the Next 20 Years



TORONTO – November 12, 2017

– Africa is expected to take delivery of 550 aircraft in the 60 to 150-seats segment between 2017 and 2036.

Bombardier Commercial Aircraft's new 20-year Market Forecast for the 60- to 150-seat segment predicts continuing growth in intra-regional flying in Africa dominated by large turboprops and small single-aisle jets.

Intra-regional traffic is forecast to grow 4.6 per cent annually over the next 20 years. The 60 to 150-seat fleet will grow by 2.4 times in order to meet the growing traffic demand.

The majority of these aircraft will have dual-class cabins; currently, 90 per cent of intra-regional seats are dual class. Passengers traveling on intercontinental widebody jet demand seamless services when connecting flights with a regional jet or turboprop.

The Forecast notes that large turboprops have a significant share of capacity on short-haul routes, having increased from three aircraft in 1990 to more than 100 today.

“Bombardier has worked closely with African airlines for several decades assisting with fleet planning, route development, flight operations, and we are uniquely positioned to meet the requirements of African airlines in the coming years,” said Jean-Paul Boutibou, Vice President, Sales, Middle East and Africa, Bombardier Commercial Aircraft. “We are proud of the CRJ Series and Q400 aircraft continued success in Africa, their outstanding economics and performance is well-recognized in the region, and we are confident that operators in the region will also benefit from the outstanding performance and capabilities of our C Series

jetliners.”

Like other airlines around the world, African carriers will look to replace their retired fleets with modern aircraft with better fuel efficiency, softer environmental footprint, greater reliability, and improved passenger comfort and amenities.

Declining yields will drive African airlines to switch their focus from cost per seat to profitability per passenger by investing in right-sized aircraft based on market demands.

Africa is expected to take delivery of 550 of these aircraft between 2017 and 2036 for a four per cent share of the world market for 12,550 aircraft valued at U.S. \$820 billion. The deliveries to Africa are expected to comprise 300 large regional aircraft (60-100 seats) and 250 small single-aisle aircraft (100-150 seats).



MDA Advances Innovative Robotics and Rovers for Space Exploration and to Support On-going Operations of the ISS

BRAMPTON, ON – December 15, 2017 – MDA, a business unit of Maxar Technologies (formerly MacDonald, Dettwiler and Associates Ltd.) (NYSE: MAXR; TSX: MAXR) today announced that it has signed four contracts with the Canadian Space Agency (CSA) with a total value at approximately CA\$53.75 million. The award includes:

- Two contract amendments to provide funding for continued

support to the robotic operations of the Mobile Servicing System (MSS). The enhancements will streamline operations and reduce operator communication load. The MSS is an essential component of the International Space Station (ISS) and its continued operations enables the Canadian Space Agency to achieve Canada's obligations and goals as a partner on the ISS.

- One contract under the Space Technology Development Program for CA\$800,000 to develop technology to enable autonomous control of future space hardware such as robotic arms, rovers, scientific instruments, and satellites.
- One contract for CA\$450,000 for a concept study for two rover types: a pressurized rover to transport astronauts on the Moon's surface and a smaller rover that would first be sent to the Moon to collect lunar samples and test the technologies required for the pressurized rover.

“Canadian robotics play a key role on the International Space Station and the advances in space robotics associated with this project not only enhances the MSS capabilities, but also provides a long term benefit in ensuring Canadian technology retains its best-in-class status,” said Marc Donato, MDA's general manager responsible for this business. “The technologies being developed under this contract offer direct spin-offs related to commercial initiatives that MDA has undertaken, such as robotically servicing satellites in space.”

The Mobile Servicing System is comprised of the Canadarm2, a highly dexterous two-armed robotic arm known as “Dextre,” and the

Mobile Base System. These three robotic systems perform a variety of operations ranging from resupply, maintenance, and servicing tasks on the space station that are critical to the on-going operations of the ISS.



P&WC's PurePower® PW800 Engine Selected to Power the New Falcon Business Jet

MISSISSAUGA – December 13, 2017 – Pratt & Whitney Canada (P&WC) announced that a member of P&WC's PurePower PW800 engine family has been selected to power the new Falcon Business Jet, which was announced earlier today by Dassault Aviation. P&WC is a subsidiary of United Technologies Corp.

The PurePower PW800 engine is optimized for high-flying, fast, long-range business jets and shares the same proven, rigorously-tested core technology used in Pratt & Whitney's award-winning PurePower family of geared turbofan commercial engines. The advanced common core technology, employed in 15 different PurePower engine applications, has amassed more than 400,000 in-service hours.

"We are honoured that Dassault Aviation has once again put its trust in P&WC for its new aircraft and we look forward to further develop our long-standing relationship with them on this new platform", said Irene Makris, Vice-President, Sales & Marketing, Pratt & Whitney Canada.

The PurePower PW800 engine incorporates the latest generation of technologies in every aspect; delivering double-digit improvement in fuel efficiency, setting a new "green" engine standard for emissions with the advanced TALON™ X combustor, and its low-noise design and low vibration levels will result in an exceptionally quiet cabin, enabling a more comfortable passenger experience.

Thanks to its robust design, exceptional maintainability, and advanced diagnostics capabilities, the PurePower PW800 engine will deliver best-in-class availability and dispatch reliability to operators. This will be coupled with the PurePower PW800 family's enhanced service offering tailored for today's operator needs.

ACADEMIC NEWS



Georgian Launching Eight New Programs in 2018

BARRIE, ON -- December 06, 2017 – To meet the demand of the local economy, Georgian College is offering eight new programs in 2018. The programs are a mix of advanced diploma, diploma, certificate and graduate certificates. Learn about all full-time programs – as well as housing, student life, athletics, services and more – in [Georgian's 2018-2019 Full-time Program Guide](#).

The new programs include:

- **Flight Services:** This one-year certificate teaches students the knowledge, skills and behaviours required to provide exceptional passenger service and deal effectively with the travelling public.

...



Two Engineering Professors Named Canada Research Chairs



Photo: Seth Dworkin, mechanical engineering (left), and Dae Kun Hwang, chemical engineering, named Canada Research Chairs.

TORONTO – November 03, 2017 – Engineering professors Seth Dworkin and Dae Kun Hwang are Ryerson's newest Canada Research Chairs.

The Canada Research Chair program invests in post-secondary institutions to retain and attract some of the brightest and most innovative minds to academia in Canada. The new chairholders are at the Tier 2 level, designated specifically for emerging researchers who are showing leadership potential in their fields.

"We are thrilled to announce two new chairholders for Ryerson, a testament to the strength in

research in our Faculty of Engineering and Architectural Science, and a tribute to the outstanding talent at the university,” said Professor Steven Liss, vice-president, research and innovation. “Our researchers are tackling important issues and the Canada Research Chair program further strengthens their research and creates opportunities for our research students.”

The university will receive funding over five years for each of the new chairholders dedicated to their research programs and to support graduate and post-graduate research in their respective fields.

Seth Dworkin, professor of mechanical engineering, has been named Chair in High Performance Computing and Sustainable Energy. His work focuses on improving emissions profiles for aircraft engines, as well as geothermal heating and cooling systems. Using computer models, Dworkin’s work looks at ways to improve performance of these systems and to develop models that are adaptable to industry use.

“Climate change and air quality are the motivators behind this work,” said Dworkin. As a chairholder, he and his team will better be able to tackle “big picture problems,” as the research program progresses over five years.

Dae Kun Hwang, professor of chemical engineering, has been named chair in Microarchitecture for Advanced Polymeric Materials. In his work, Hwang is creating “novel polymer-based platforms” using microparticles with 3D shapes, membranes with 3D pores, and surfaces with wrinkled 3D microstructures. His research aims to create solutions with biomedical applications such as less invasive microneedles for therapeutic drug delivery, low-cost

detection of circulating tumor cells and better understanding of cellular responses to 3D environments.

The two new chairs are both part of Ryerson’s Faculty of Engineering and Architectural Science. Dean of the faculty, Tom Duever, said the new chairholders serve to enhance Ryerson’s reputation in engineering and will help attract bright young minds.

“The Canada Research Chair Program brings prestige and recognition to Ryerson,” he said. “These appointments will serve to not only advance research in areas of global importance such as sustainable energy and fundamental understanding of our world through cell growth patterns, but will also help us attract the best graduate and post-graduate students in those fields to build on our strengths.



Toronto’s Space Flight Laboratory is a Pioneer in the Evolution of Small Satellites

November 2, 2017 – Dr. Robert Zee is the only director the Space Flight Laboratory (SFL) at the University of Toronto Institute of Aerospace has known since its inception in 1998. Over the years SFL has been an innovator in the field of small satellites and without question can be regarded as one of its pioneers.

Marc Boucher, of SpaceQ, conducted an interview with Dr. Zee.

What started as an idea has involved into a educational powerhouse in the small satellite field. SFL has produced engineers that have gone on to be part of startups such as Deep Space Industries. Along the way they also turned their original idea into a business. A business that is growing.

Today, SFL employs over 50 people and they have 18 satellites to their credit that have been launched to orbit that are performing well.

There are another 15 satellites in development and that number is increasing.

[Listen here!](#)

2017 Engineering Alumni Network (EAN) Award Recipients

TORONTO – November 2, 2017 – The University of Toronto’s Engineering Faculty recently presented the 2017 EAN Awards celebrating and recognizing alumni for their outstanding achievements.

Aerospace highlights include:

Engineering Alumni Hall of Distinction Award

Rocco Martino (UTIAS PhD 5T6)



[Watch video](#)

Dr. Rocco Leonardo Martino is the inventor of the CyberFone — the first smartphone that put the world in the palm of the user’s hand — and the driving force behind the software systems permitting secure real-time video, voice and data linkages. He graduated with a “first” in honours mathematics and finance from the University of Toronto and went on to earn a doctorate in aerospace engineering from the University of Toronto Institute for Aerospace Studies (UTIAS). His work included extensive use of the University’s Ferranti Computer in the early 1950s. He discovered the heating factors during the re-entry of space vehicles, which led to the heat shield developments that made space travel possible. He is the founder and chairman of the board of U.S. Robots, Inc. and was the founder, chairman and CEO of XRT, Inc., a global leader in providing complete treasury, cash and banking relationship management solutions for many of the world’s largest corporations and government entities. Martino is also the author of 28 books as well as scores of papers, and numerous corporate monographs on computers, communications,

networks and planning. He served as professor of engineering and chair of the Systems Engineering Department of the University of Waterloo and as professor of mathematics at New York University. He has lectured around the world. Martino served on the Boards of St. Joseph’s University, the World Affairs Council, the Foreign Policy Research Institute — of which he is currently a Senior Fellow — the Gregorian University Foundation, The Order of Malta and numerous other boards. He has been honoured by the Monte Jade Society, the National Italian American Foundation of Washington, the CYO Hall of Fame of Philadelphia, received honorary doctorates from Gonzaga University, Neumann University and Chestnut Hill College, and was knighted by Pope St. John Paul II as a Knight of St. Gregory. He currently serves on the Advisory Board of UTIAS. A visionary leader and philanthropist, Martino continues to create, dream and imagine possibilities through his writing and philanthropy. He not only predicts the future, he creates it.

Tom Siddon (UTIAS MASc 6T6, PhD 6T9)



[Watch video](#)

For over 50 years, The Honourable Tom Siddon has contributed to his profession, country and local community. After graduating from the University of Alberta as the gold medalist in his class, he went on to pursue his master’s and PhD degrees at the University of Toronto Institute for Aerospace Studies (UTIAS). In his early career, he split his time between teaching at UBC and growing his aero-acoustics engineering consulting firm. In 1976, while teaching at UBC, Siddon took on a leadership role as city councillor for Richmond, BC. From there, his participation and achievement in the public service grew. He was successively elected in five federal elections between 1978 and 1993, and worked under several prime ministers in various cabinet roles. His appointment as Minister of Indian Affairs and Northern Development in 1990 led to what he considers his most significant achievement: the creation of Nunavut. After his federal career, he helped develop a long-range water management plan for the Okanagan river valley and even found time to serve on his local school board and also as a Regional District Director — a role which he continues to hold today.

The full list of honourees can be found at the [Alumni Awards website](#).



Government of Canada Invests in National Security Technology

WATERLOO, ON – December 19, 2017 – The Canadian Space Agency (CSA) is awarding \$1.5 million to the University of Waterloo's Institute for Quantum Computing (IQC) to lead the science of a mission called the Quantum Encryption and Science Satellite (QEYSSat), which will protect the communications and data of Canadians on Earth and in space.

It is estimated that within 10 to 20 years, the encryption codes used by computers today will be easily decoded by high-performing quantum computers, making current encryption technology obsolete.

This investment will advance encryption methods, which use highly advanced computing technology to create unbreakable security codes.

It will enable the CSA to leverage IQC's expertise to enhance Canada's position as a world leader in the emerging market for quantum technology. It will contribute to developing the highly qualified workforce needed in this important sector, and position Canada's space sector to play a critical role in the upcoming quantum technology revolution—a significant global business opportunity.

This initiative aligns with the Government of Canada's Innovation and Skills Plan.

Quotes

"The development of revolutionary technologies like quantum encryption will provide Canadians with security, safety, reliable government services and protection of their privacy. This investment enables the University of Waterloo to advance Canada's technological and scientific advantage in quantum technologies. It creates new opportunities to develop a highly qualified workforce in Canada and opens new markets and commercial opportunities around the world."

*The Honourable Navdeep Bains,
Minister of Innovation, Science and
Economic Development*

"Once again, the University of Waterloo is demonstrating its impressive leadership in developing innovative new ideas and technologies. As our economy becomes more globally connected, and more trade is done online, protecting Canadians' digital information has become vitally important. Thanks to today's investment, we are building on Canadian strengths to support the development of new encryption technologies that will keep digital information safe, while also creating new, well-paying jobs in the Waterloo region."

*The Honourable Bardish Chagger, Leader
of the Government in the House of
Commons and Minister of Small Business
and Tourism*

Quick Facts

- The CSA's next step will be to request proposals from the space industry to develop the satellite needed for the QEYSSat mission.
- Current quantum encryption technology, called quantum key distribution, relies on ground fibre optic cables and is currently limited to a

200-kilometre distance. A future QEYSSat mission would seek to demonstrate quantum key distribution between a satellite and a grounded network as a way to overcome the distance limits.

Waterloo Partners to Train Next Generation of Aviators as Possible Global Pilot Shortage Looms

WATERLOO, ON – November 6, 2017 – The University of Waterloo will partner with a special agency of the United Nations to offer an introductory course on aviation that anyone in the world can take for free.

Waterloo's agreement with the International Civil Aviation Organization (ICAO) comes as a recent study from CAE that projected that an increase in airline passengers is expected to double the size of the commercial aviation industry over the next 20 years. There are not enough pilots trained or training to meet that demand. UWaterloo has the largest university-level aviation program in Canada.

"The aviation program at Waterloo is only 10 years old, yet it has quickly become the leading program of its kind in the country. I am proud that our faculty and students at Waterloo will help establish the next generation of professionals to fulfill global needs and demand," said Feridun Hamdullahpur, president and vice-chancellor of Waterloo, who was in Montreal for the signing of the Memorandum of Understanding between Waterloo and ICAO. "I'm excited for the future of aviation at Waterloo and pleased to see this partnership with a special agency of the United Nations flourish."

The partnership involves the Fundamentals of the Air Transport System (FATS) e-learning course. Suzanne Kearns, a professor in Waterloo's aviation program a vice-chair of ICAO's Next Generation of Aviation Professionals (NGAP) program designed it. The pioneering course can be taken without a direct connection between the learner and the instructor, which makes it accessible to anyone anywhere who has an interest in aviation.

"This new partnership represents an important first step toward addressing the shortage of highly-skilled personnel facing the aviation industry," said Fang Liu, secretary-general of ICAO. "Providing greater access to affordable quality training is key to attracting, educating and retaining the next generation of aviation professionals."

The course contains nine modules covering air law, aircraft, operations, navigation, airports, security, environment, accidents and safety. Each narrated module ranges from 45 to 90 minutes in duration, and profiles aviation professionals working within that area. A combination of imagery, videos, interactive cases and problems are incorporated to explore sector-related matters.

"With such need for the next generation of aviation professionals, this industry offers a variety of exciting career opportunities. However, young people may be intimidated by the cost of training or just not know about the many diverse careers that exist in the industry," said Kearns, who teaches in Waterloo's Faculty of Environment. "I hope that this course helps the next generation of aviation professionals find the path to a rewarding career in the growing aviation sector."

The new course will be offered for free on the ICAO website late this year. Students can earn an electronic certificate with ICAO and Waterloo appellation when they pass the exam, which costs \$100 USD to write.



SpaceQ Interviews Dr. Michael Daly on Canada's Participation in the OSIRIS-REx Asteroid Sample Return Mission

November 23, 2017 – Marc Boucher, of SpaceQ, spoke with Dr. Michael Daly, Associate Professor at York University about the international, though NASA led, Origins, Spectral Interpretation, Resource Identification, Security-Regolith Explorer mission, or as it's commonly called, OSIRIS-REx.

The OSIRIS-REx spacecraft will rendezvous with near-Earth asteroid Bennu next August where it will conduct a series of science investigations including returning a sample to Earth to be analyzed. NASA says the mission will help scientists investigate how planets formed and how life began, as well as improve our understanding of asteroids that could impact Earth.

The OSIRIS-REx spacecraft launched on September 8, 2016. Canada is participating in the mission by providing the OSIRIS-REx Laser Altimeter or OLA, which will create a 3-D map of asteroid Bennu's shape along with helping with navigation.

Dr. Daly is the principal Investigator of the Canadian Science Team. York University's

Planetary Exploration Instrumentation Laboratory is the lead university for the Canadian OLA instrument contribution. While York University is taking the OLA instrumentation lead, other Canadian contributors include the University of Calgary, the University of British Columbia, the University of Winnipeg, the University of Toronto and the Royal Ontario Museum.

The mission to asteroid Bennu will continue until March 2021 when the spacecraft will return to Earth arriving 2 1/2 years later in September 2023. At that point the sample return capsule will return to Utah where it will be collected and analyzed.

[Listen here!](#)

MUSEUM NEWS

CANADIAN WARPLANE HERITAGE



www.warplane.com

No current news.

TORONTO INTERNATIONAL AEROSPACE

[formerly Canadian Air & Space Museum]

www.casmuseum.org

No current news.

NATIONAL AIR FORCE MUSEUM OF CANADA



NATIONAL AIR FORCE MUSEUM OF CANADA
MUSÉE NATIONAL DE LA FORCE AÉRIENNE DU CANADA

airforcemuseum.ca

No current news.

CASI'S LOCAL



BOMBARDIER
the evolution of mobility



CORPORATE PARTNERS

