



CASI TORONTO FLYER

JANUARY 2019, Volume 26 #3

Toronto Branch Membership Newsletter

THE FLYER WILL BE PUBLISHED ON A BI-MONTHLY BASIS UNTIL A NEW EDITOR VOLUNTEERS

NEWSLETTER LINKS

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

[Local News](#)
[Industry News](#)
[Academic News](#)
[Museum News](#)

UPCOMING CASI EVENTS

THERE IS A \$5 CHARGE FOR NON-MEMBERS

Our next CASI Toronto Branch meeting will be a tour of the Pratt & Whitney, Mississauga plant in late January 2019.

Watch our [Facebook](#) page for information about CASI Toronto Branch meetings.

CONTACT US

Get in touch with CASI Toronto Branch Executive with questions, comments or suggestions: casitorontobranch@gmail.com or on [Facebook](#) ("CASI Toronto").

Contact information for specific Executive members and additional event information is also available on the [CASI website](#).

Our current Executives are:

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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 at:
casitorontobranch@gmail.com

The 2019 CASI Senior Awards

CASI is now accepting nominations for 2019 CASI Senior Awards. Over the decades these Awards have celebrated excellence in Canadian aerospace: aviation, engineering, management and ingenuity. For full details on the criteria for each Award as well as nomination forms, click the button at the end of this message.

Full details are available at the [CASI website](#).

Presentations will be made to the honourees during the traditional CASI Senior Awards Gala Reception and Dinner. The Gala is being held in the ballroom of the Sheraton Laval Hotel on the evening of Wednesday May 15, 2019, as part of the program of the three-day CASI AERO 2019 Conference.

If you know someone or a team of individuals deserving of recognition as the recipient of one of our prestigious Awards, we strongly encourage you to submit a nomination.

Nomination deadline:

January 28, 2019

LOCAL NEWS

Mentoring the Next Generation of Women in Aviation

According to the Air Line Pilots Association International, the percentage of women pilots in commercial aviation was about 5.18% in 2018. This extremely low number of women is considerably less in other aviation related fields as well, and therefore, begs the question why this is so.

One of the reasons most often noted is the scarcity of women role models who are able to provide information on the various career options available in aviation related fields if one has a basic understanding of science, technology, engineering, and mathematics (STEM). Given the current emphasis on artificial intelligence, remotely piloted aircraft and drones, an understanding of social science especially cognitive psychology and applied sociology will be an added advantage. Very few aviation programs attempt to integrate these subject matters with aviation. For example, student interest in mathematics and statistics can be enhanced considerably if integrated and applied within an aviation accident investigations course.

Contemporary aircraft today consists of thousands of new material and the next generation of aviation professionals must also have a basic understanding of chemistry and biology. The field of ceramic matrix polymer components (CMC) technology for commercial jet engines that are

much tougher than metal counterparts, but much lighter and heat-resistant will advance hypersonic travel. And don't forget biology and bio-fuels!

In order to facilitate more girls and young women to consider aspects of aviation as a future career option, mentors are needed. At present, there are several voluntary organizations in Canada that provide a mentoring and networking role such as Canadian Women in Aviation (CWIA), BizAv Young Talent Initiative, and Elevate Aviation.

A long time CASI member who has advanced the role of women in science and engineering is Dr. Catherine Mavriplis. She was selected as the NSERC/Pratt and Whitney Canada Chair for Women in Science and Engineering, the first woman from aviation and aerospace to advocate for advancing women in aviation and aerospace. Her students are now being recognized by the Northern Lights Foundation as "Rising Stars". More CASI mentorship volunteers and industry participants that provide internship opportunities will considerably enhance future gender balance in Canadian Aviation and Aerospace.

Many thanks to K. Victor Ujimoto, Ph.D of the Commercial Aviation Management Program at Western University for this article. Look for more articles from Prof. Ujimoto in future issues.



Upcoming Meeting Information - CAHS Toronto Chapter Meeting

When: Saturday, Feb. 2, 2019

Time: 1:00 PM

Location: Canadian Forces College, 215 Yonge Blvd. at Wilson Avenue, Toronto, (Lt. – Gen Guy Simonds Auditorium – Ground Floor)

All aviation enthusiasts are welcome!

INDUSTRY NEWS

BOMBARDIER

Bombardier Announces Sale of Non-Core Assets and Strategic Actions to Streamline the Company and Drive Productivity

TORONTO – November 8, 2018 –

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Focusing the Portfolio, Divesting Non-Core Assets

Bombardier also announced today the sale of a number of non-core assets, in line with its strategy of focusing on growth opportunities in its Transportation, Business Aircraft and Aerostructures segments. The Company entered into definitive agreements for (i) the sale of the Q Series aircraft program and de Havilland trademark to a wholly owned subsidiary of Longview Aviation Capital Corp. for approximately \$300 million; and (ii) the sale of Business Aircraft's flight and technical training activities to CAE and the monetization of royalties for approximately \$800 million.

Both transactions are expected to close by the second half of 2019, following the usual regulatory approvals. Net proceeds from the transactions are expected to be approximately \$900 million after the assumption of certain liabilities, fees, and closing adjustments.

Streamlining the Organization

Bombardier also launched a new enterprise-wide productivity program to further streamline, lean out and simplify the Company. The

initiative includes two actions. First, with the heavy aerospace investment phase successfully completed, Bombardier will right-size and redeploy its central aerospace engineering team. Key engineering team members will be redeployed to the business segments, with the largest group moving to Business Aircraft, to ensure they have all the necessary capabilities for future business jet development programs.

Bombardier will also establish a new Advanced Technologies Office (ATO), which will be led by François Caza, who has been appointed Bombardier's Chief Technology Officer. The ATO will focus on systems design and engineering, including applying experience from Bombardier's aerospace programs to its rail transportation business.

In addition to right-sizing and redeploying central engineering, Bombardier has launched a company-wide restructuring initiative focused on optimizing production and management processes, flattening management structures and further reducing indirect costs.

Collectively, these actions will result in a reduction of approximately 5,000 positions across the organization over the next 12 to 18 months, leading to annualized savings of approximately \$250 million at full run rate, which we expect by 2021. Bombardier anticipates recording a restructuring charge in 2019 of approximately the same amount as special items.

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NOTE: The [complete Report](#) is available online.

Bombardier Selling Q400 Program to Viking



TORONTO – November 7, 2018

– On November 7, 2018, the Corporation entered into a definitive agreement for the sale of the Q Series aircraft program assets, including aftermarket operations, to a wholly owned subsidiary of Longview Aviation Capital Corporation, for gross proceeds of approximately \$300 million. The agreement covers all assets and intellectual property and Type Certificates associated with the Dash 8 Series 100, 200 and 300 as well as the Q400 program operations at the Downsview manufacturing facility in Ontario, Canada. The transaction is expected to close by the second half of 2019, subject to customary closing conditions and regulatory approvals. Net proceeds for this transaction are expected at approximately \$250 million net of fees, liabilities and normal closing adjustments.

Viking is part of Longview. Headquartered in Victoria, British Columbia, Viking is the global leader in utility aircraft services, and manufacturer of the world-renowned Series 400 Twin Otter. Viking is the Original Type Certificate holder for all out-of-production de Havilland aircraft, DHC-1 through the DHC-7, as well as the Canadair 215 and CL-415 aerial firefighters. Viking provides exclusive global

spare parts manufacturing and product support for these fleets.

Viking will now take over the Q400 series.

Longview Aviation Capital Corporation, parent company to Viking Air Limited, a leading Canadian aircraft manufacturer, today agreed to acquire, through an affiliate, the entire Dash 8 program including the 100, 200 and 300 series and the in-production Q400 program from Bombardier Inc. Also included as part of the transaction are rights to the de Havilland name and trademark in an all-Canadian transaction.

Once completed, Longview will become North America's largest commercial turbo-prop aircraft manufacturer.

"The Dash 8 turbo-prop is the perfect complement to our existing portfolio of specialized aircraft including the Twin Otter and the Canadair CL 215 and 415 series of water bombers," said David Curtis, CEO of Longview Aviation Capital Corp. "We see enormous value in the de Havilland Dash 8 program, with these aircraft in demand and in use all around the world."

As part of the agreement, Longview will receive all assets and intellectual property and Type Certificates associated with the Dash 8 program. Upon the closing of the transaction, Longview will also assume responsibility for the worldwide product support business – covering more than 1,000 aircraft either currently in service or slated for production.

Longview will continue to independently operate the program at the original de Havilland manufacturing site located at Downsview, Ontario upon closing

of the transaction. The Downsview site was sold by Bombardier earlier this year but, under the terms of a lease with the new owners and a license from Bombardier, production will remain on-site until at least 2021. As part of the transaction Longview also looks forward to welcoming Bombardier employees currently associated with the production, support and sales of the Dash 8 program.

"We are committed to a business-as-usual approach that will see no interruption to the production, delivery and support of these outstanding aircraft," added Curtis. "With the entire de Havilland product line reunited under the same banner for the first time in decades, we look forward to working with customers, suppliers and employees upon close of the transaction to determine what opportunities lie ahead."

Longview and Bombardier will work closely in the period until the closing of the transaction to ensure a seamless transition for employees, customers, suppliers and other stakeholders with no interruption in production, delivery and support of the aircraft.

This transaction builds on Longview's established track record of acquiring and successfully operating significant aircraft manufacturing, parts and serving programs including the Twin Otter program and the Canadair CL 215 and 415 waterbomber series.

The transaction is subject to typical closing conditions and the receipt of regulatory approvals. The sale and transaction are expected to close by the second half of 2019.



Kepler's Next Wideband Satellite Reaches Orbit on the Indian Polar Satellite Launch Vehicle

TORONTO – November 29, 2018

– At 04:27:30 a.m. UTC (11:47:30 p.m. EST), Kepler Communications successfully launched their second wideband satellite to low-Earth orbit (LEO) on the Indian Polar Satellite Launch Vehicle (PSLV) C43 mission that lifted off from the Satish Dhawan Space Centre in Sriharikota, India.

Kepler's latest satellite within the company's network will be used to deliver service to early customers. The first satellite was launched in January 2018. Both satellites carry a Ku-band payload onboard that is used for wideband connectivity. The third satellite will launch in 2019 and will provide narrowband connectivity for the Internet of Things (IoT) devices.

Mina Mitry, CEO of Kepler, says of the launch "This is an exciting month for Kepler! Following our recent FCC approval, the successful launch of our next satellite marks an important milestone for the team to deliver our network on schedule. This is but the start of our upcoming and regular launch cadence. We continue to increase network capacity, and deliver a more persistent, reliable, service to our customers every step a long the way."

The lessons learned from almost a year of operating the first satellite were incorporated into the

development of the second to improve the reliability. Kepler has already demonstrated a capability to deliver upwards of 40 Mbps to 60cm diameter VSAT (Very Small Aperture Terminal) and over 300 Mbps to Kepler's 3.4m gateway in Inuvik, Canada. Kepler also became the first company to use a wideband LEO satellite to acquire, track, and communicate with an electronically-steered antenna when Kepler and Phasor performed their collaborative demonstration.

As Kepler builds out the capabilities on their satellite infrastructure, the company is also adding capacity on their ground segment. In addition to their gateway deployed in Inuvik, Canada, Kepler has also recently deployed ground stations on Svalbard and in New Zealand. As new ground stations and gateways are added, Kepler is able to increase the reliability of their communication service and decrease the latency of customer data delivery.

CASE was built in collaboration with AAC Clyde, and Bright Ascension Ltd. The satellite payload is Kepler's proprietary software defined radio and antenna that uses Enclustra and AHA (of Comtech EF) components. The satellite was launched by Antrix Corporation Ltd, a wholly owned Government of India company, with the support of ISED, Canada for licensing.

Kepler's ultimate goal is to deliver in-space connectivity to address the data need from space faring assets, and support the future space economy. However, Kepler's network currently focuses on delivering wideband and

narrowband connectivity. With this launch on the back of receiving FCC market access authorization and the announcement of Kepler's 16M USD Series A round of financing, the company is well poised to take a leadership role in LEO communications.



Magellan Awarded CDN \$140 Million Contract Extension with Airbus

TORONTO – November 5, 2018 – Magellan Aerospace Corporation announced today, that they have secured a six year agreement with Airbus for a contract extension for the manufacture of A350 XWB centre wing box and keel beam detail parts. It is estimated that revenue generated from this work package will exceed CDN \$140 million dollars over the term of the contract. The package consists of a number of large structural, machined components, and will be manufactured by Magellan in the United Kingdom and supplied to the Airbus assembly facility in Nantes, France.

Mr Haydn Martin, Magellan's Vice President, New Business Development said, "This contract extension has been achieved through a combination of demonstrated operational excellence and market competitive pricing. As a strategic partner to the Airbus Group, Magellan continues to align our technology investments and manufacturing best practices to meet their current and future requirements.



Instrument built by Maxar Technologies' MDA for NASA's OSIRIS-REx Mission provides high resolution 3D scans of the Asteroid Bennu

BRAMPTON, ON – December 10, 2018 – MDA, a Maxar Technologies company, today announced that the laser altimeter instrument it built for the Canadian Space Agency's (CSA) contribution to NASA's Origins, Spectral Interpretation, Resource Identification, Security, Regolith Explorer (OSIRIS-REx) mission has scanned and collected its first data set of Bennu, an asteroid in our solar system.

Launched on September 8, 2016, OSIRIS-REx will study and ultimately return a physical sample of Bennu to Earth. The CSA contributed the MDA-built OSIRIS-REx Laser Altimeter (OLA) instrument, a scanning Light Detection and Ranging (LIDAR) sensor. Powerful enough to scan Bennu from up to seven kilometers away, OLA will measure the distance between the spacecraft and Bennu by firing short pulses of laser light toward the asteroid and measuring the time of return flight for each pulse to produce an accurate and precise 3D model of Bennu's shape and other exterior structures. This data will be valuable to scientists to better understand the characteristics of Bennu and will help OSIRIS-REx mission planners select the optimal location to gather a sample of the asteroid for return and analysis on Earth.

“This mission is another excellent example of an innovative Canadian technology that supports global space exploration and expands the scientific knowledge and discoveries for humankind,” said Mike Greenley, group president of MDA. “MDA has an industry-leading space portfolio with expertise in space robotics, sensors and exploration capabilities, further enhanced by our recent acquisition of Neptec, whose powerful and versatile sensor and vision systems augment the functionality of robotic systems and deliver guidance and navigation information for space vehicles.”

The OSIRIS-REx spacecraft arrived at Bennu on December 3, 2018, with OLA beginning its scans shortly thereafter. After the sample site is selected, a sample is set to be collected in July 2020. The OSIRIS-REx spacecraft will begin its return journey in March 2021, and deliver the sample back to Earth in September of 2023.

Maxar's MDA Selected to Provide Subsystem Designs for Next-Generation International Mars Rover Mission

BRAMPTON, ON – December 4, 2018 – MDA, a Maxar Technologies company (NYSE: MAXR) (TSX: MAXR), announced today that it was selected by Airbus to provide a conceptual design of a rover mobility system and sample acquisition system planned to explore Mars and acquire samples that will be returned to Earth. The rover, a small vehicle approximately 1 metre wide by 1.5 metres long, will

be capable of withstanding the harsh atmosphere of Mars and its challenging terrain. The ‘Sample Fetch Rover’ is planned to be part of the mission concepts the European Space Agency (ESA) is exploring with NASA for an international Mars Sample Return campaign between 2020 and 2030. The new contract is one of a number of innovative programs MDA’s space systems is supporting.

“MDA’s unparalleled flight heritage and end-to-end system capabilities in robotic systems provides a solid foundation for new missions to explore planets, asteroids and other bodies in the solar system,” said Mike Greenley, group president of MDA. “As a global leader in technology and products for space, MDA pushes the boundaries in advancing spaceflight and exploration: from sensors and vision systems, to robotic arms and autonomous robotics to planetary science instruments.”

Under the Mars Sample Return campaign, three launches are planned to accomplish the tasks of landing on the red planet and finding, collecting, storing samples, and returning them to Earth. The first of the launches under the NASA’s Mars 2020 mission will explore the surface and rigorously document and store a set of samples in canisters to be retrieved later for flight to Earth. The second launch will send the Sample Return Lander mission to land a platform near the Mars 2020 site. From here, the rover will retrieve the stored samples.

Once the Sample Fetch Rover has collected the samples, it will return to the lander platform so they can

be loaded into the Mars Ascent Vehicle. This vehicle will perform the first liftoff from Mars and carry the container into Mars orbit.

ESA’s Earth Return Orbiter will be the third launch in this campaign to Mars and it is timed to capture the basketball-size sample container orbiting Mars. The spacecraft will then return to Earth, where it will release the entry capsule, allowing extensive analyses of the samples in laboratories with varied scientific equipment too large to take to Mars.

The Mars 2020-2030 mission addresses high-priority science goals for Mars exploration, including key questions about the potential for life on Mars. The mission also provides opportunities to gather knowledge and demonstrate technologies that address the challenges of future human expeditions to Mars.

Maxar Technologies' MDA to Design Lunar Rover Concept for Canadian Space Agency

BRAMPTON, ON – October 29, 2018 – MDA, a Maxar Technologies company, today announced that it has been selected by the Canadian Space Agency (CSA) to provide a conceptual design of a lunar rover for science exploration and to prepare for human missions on the lunar surface. As part of MDA’s concept, the rover would be engineered to travel up to 600 km over its lifetime in the harsh lunar environment via tele-robotic control and advanced autonomous mode, relying on artificial intelligence controlled from the proposed Lunar Gateway and from Earth.

The proposed lunar rover concept would conduct expeditions on the far side of the moon near the South Pole region using a robotic arm and a sample capture system to collect samples, carrying a suite of science instruments up to 120 kg. The rover would then return to its lander and deposit the samples into a small rocket known as an ascent vehicle that will carry them to the Gateway. The samples would later be returned to Earth for analysis to improve our understanding of the moon and the early formation of our solar system to prepare for extended human presence beyond Low Earth Orbit. Advancing science is a major goal of this mission and for the rover, the sample selection could utilize MDA-developed sensors for sample selection.

“MDA’s innovative robotic solutions have been expanding our understanding of space since the 1980s, with the space shuttles’ Canadarms and the International Space Station’s Mobile Servicing System, comprised of Canadarm2, a highly dexterous two-armed robotic arm known as “Dextre” and the Mobile Base System,” said Mike Greenley, group president of MDA. “The development of the Lunar Gateway and lunar rover are critical next steps in deep space exploration, and MDA is proud to support these initiatives and advance Canada’s leading position in space.”

The rover concept design forms part of a larger study that includes contributions from the European Space Agency, the Japanese Space Agency and the Canadian Space Agency, with the objective of preparing technologies and operations for landing astronauts

on the surface as early as the late 2020s. In preparation for these landings, this study will define a plan to land the rover by the mid-2020 timeframe.

Key challenges for the rover include operating during the hot lunar day and cold lunar night, each of which lasts approximately 14 consecutive Earth days. The lunar dust is unlike the dirt and soil found anywhere on Earth and affects moving parts and optical coatings and can be problematic for navigation. MDA will leverage experience gained in development of elements of the ExoMars rover, scheduled to launch in 2020, in development of the Lunar rover.

MDA is partnering with leading Canadian companies for this study: Magellan Aerospace, Mission Control Space Services Inc. and Deltion Innovations Ltd.



**Porter Airlines Sponsors
Northern Lights Mentorship
Program**

TORONTO – November 26, 2018
– Porter Airlines is sponsoring a new mentorship program with The Northern Lights Aero Foundation to attract and retain more women in aviation and aerospace.

The Northern Lights Mentorship Program is designed to connect aspiring and experienced aviation professionals. Participants will

broaden their professional networks, receive practical advice and form a support network to help guide them through their career. Mentors, both male and female, will motivate and inspire women to pursue opportunities in aviation and aerospace while enhancing their leadership and communication skills.

“Women are generally underrepresented in aviation and aerospace. The Northern Lights Mentorship Program helps break down barriers by connecting women with mentors who know the industry and generally have a passion for what they do and want to share it with other aviation enthusiasts,” said Robert Deluce, president and CEO of Porter Airlines. “There are many opportunities within aviation - from being a pilot, to a maintenance engineer or dispatcher - having someone to help navigate the path forward is invaluable.”

The Northern Lights Mentorship Program focuses on three phases of career planning and connects participants with mentors who can best support them:

1. Considering a career within aviation and aerospace (imagining)
2. Training and development (training)
3. Established within the industry (developing)

“It is so important, in the pursuit of bringing in and retaining more women in this industry, to have a tool whereby they can have mentors suited to their needs, whether it is in simply considering a career, the struggles in training or discovering new pathways,” said Joy Parker Blackwood, President,

Northern Lights Aero Foundation. "The new mentorship program supports our mission to create career opportunities in aviation and aerospace for Canadian women."

"Throughout the various stages of my professional life, my mentors have helped me in countless ways make informed decisions about my career choices and allowed me to build a network of immeasurable connections. Their advice and willingness to share their personal experiences with me were constant sources of inspiration and support and I feel it is my duty to pay it forward by mentoring others so they too can succeed," said Eva Martinez, Vice President, In-Service Support, PAL Aerospace. "One of the benefits of mentoring is the invaluable relationships that develop over time. These help me become a better person, role model and leader."

Porter's sponsorship of the mentorship program includes funds and in-kind services for its development and design. The program launched at the Northern Lights Awards Gala on September 29; an annual event honouring outstanding women in Canadian aviation and aerospace.

[Join The Northern Lights Mentorship Program as a mentor or mentee by visiting the website.](#)

Porter's support of the Northern Lights Aero Foundation stems from its Women Soar at Porter program, which launched in 2016. The program is led by dedicated Porter volunteers who actively promote opportunities that exist for women in aviation. At Porter, female pilots represent approximately 13% of the total group, versus approximately 5%

for the overall industry. Porter has the highest percentage of female pilots in Canada.



Bombardier Global 7500 Business Jet Received Transport Canada Certification

AJAX, ON – October 10, 2018 – On September 28th, 2018, Transport Canada issued the Type Certification for the Global 7500 Business Jet to Bombardier. Safran Landing Systems is proud to have contributed to this success with its many equipment on the aircraft.

The Global 7500 is the new long-range Business Jet from Canadian manufacturer Bombardier. The aircraft received type certification from Transport Canada on Friday, September 28th, 2018, during a ceremony held at its Global Finishing Centre in Dorval. This milestone comes at the end of a flight test program that ran from November 2016 to September 2018, during which the aircraft exceeded all its initial performance expectations.

Safran Landing Systems provides several pieces of equipment on this aircraft: the Nose Landing Gear, Main Landing Gears and fifty-four Systems Components/LRUs for the aircraft.

This certification attests that the aircraft meets all applicable technical airworthiness requirements and that it complies with customer standards or

technical requirements.

Nancy Barber, Bombardier's Global Program Manager, praised the work of the suppliers: "With certification, we have turned our goal of redefining business travel into a reality. The Global 7500 aircraft is the largest and longest-range business aircraft ever built. [...]An accomplishment this significant, from clean-sheet design to certification, would not have been possible without the passion, ingenuity, professionalism and hard work of our valued suppliers."

Bombardier and Safran Landing Systems will now move their focus to the next major milestone of Entry into Service (EIS), which is targeted for the end of 2018.

ACADEMIC NEWS



CAE Opens CAE Women in Flight Scholarship Applications

TORONTO – December 17, 2018 – CAE announced today the opening of applications for the CAE Women in Flight scholarship program in collaboration with five leading global airlines. Five full scholarships, covering the entire cost of a cadet pilot training program, including accommodation and travel, will be awarded to outstanding female ambassadors to become role models and to

inspire more women to join the pilot profession. Upon successful completion of their training program, the selected candidates will have the opportunity to secure their first pilot job and fly for one of the following airlines: Aeromexico, AirAsia, CityJet, easyJet, or a fifth operator which will be unveiled in the upcoming weeks, subject to certain conditions.

“As part of this first edition, CAE will provide financial support to aspiring female pilots by awarding five full scholarships to one of CAE’s selected airline-mentored cadet pilot training programs across our global training network,” said Nick Leontidis, CAE’s Group President, Civil Aviation Training Solutions. “Over the next decade, the civil aviation industry will need over 300,000 new pilots. With women currently representing less than 5% of pilots, we want to take a proactive approach to promote a better gender balance and tap into a wider pool of talent. We are looking for dedicated candidates who can inspire a new generation of professional pilots, and we look forward to accompany these future ambassadors, and passionate women throughout their journey.”

CAE’s *Women in Flight* scholarship program is a competitive program seeking for female ambassadors who demonstrate leadership skills, active involvement in their communities, perseverance and who are passionate about aviation. The program encourages passionate and exceptional women to accomplish their goal of becoming professional pilots. CAE will follow selected candidates on their journey to the flight deck and give them the opportunity to

become aviation role models and inspire even more women to join the pilot profession. Eligible female candidates who meet the requirements of the selected airline’s current cadet program and of the scholarship are invited to submit their applications via CAE’s website at cae.com/womeninflight. More details about the program and the selection process can also be found online.



2019 CASI Scholarships

CASI is currently accepting applications for both the Elvie L. Smith Scholarship and the Charles Luttmann Scholarship.

Nominees must be Canadian citizens and a Student Member in good standing of CASI. Applicants must be entering the last year of undergraduate studies in the year the student receives the scholarship.

For full details on the criteria for each Scholarship as well as nomination forms, see the [CASI website](#).

CENTENNIAL
COLLEGE

New Innovation Hub Shifts Applied Research Off Campus

TORONTO – November 30, 2018

– Key stakeholders from industry and funding partners gathered to officially open Centennial College’s Innovation Hub in a Scarborough commercial office building on November 29. The leased storefront consists of 4,500-sq.-ft. of collaborative space tailored for industry-college applied research activities, located within walking distance of Progress Campus.

The space is designed for students to work on industry-led projects in three critical fields: aerospace, health technologies and cybersecurity. College students are paid on a part-time basis for their participation. Among several other projects, they have been using the Hub since September to investigate electrically-actuated aircraft landing gear with Safran Landing Systems.



“When the college realized that the research space allotted for this work was too limited on campus, it searched outside for new space to solve the problem,” noted Kyle Schmidt, Vice President, Product Development and R&T Engineering at Safran Landing Systems Canada. The manufacturer has been working on

electrified landing gear for 15 years, and came to Centennial to engage its students in certain aspects of the applied research.

“We’ve been impressed with the energy the students have brought to the work,” Schmidt told the approximately 100 guests who had come to tour the new space. “Working with Centennial on this project provides a great opportunity to find our future employees.”

The Innovation Hub’s flexible, open space is conducive to collaborative work between groups of people and can be easily reconfigured. It features a prototyping lab with powerful computer-aided design (CAD) stations, and a cybersecurity lab that is isolated to enable testing in a secure environment.

Cybersecurity is a rapidly expanding field that prompted Centennial to launch a graduate certificate program for college and university graduates looking for a specialty skill set. Centennial also established the Wearable, Interactive and Mobile Technologies Access Centre in Healthcare (WIMTACH), which assists enterprises in the wearable technology sector in the east GTA’s innovation ecosystem.

Representatives from NSERC and the Ontario Centres of Excellence (OCE) were on hand to tour the facilities at 305 Milner Avenue and to speak with students. The Natural Sciences and Engineering Research Council of Canada (NSERC) is a federal government agency that provides research funding for the natural sciences and engineering. OCE connects entrepreneurs, industry, academia and investors to commercialize

innovation.

The Innovation Hub is an outgrowth of the college’s Applied Research, Innovation and Entrepreneurship Services (ARIES). Centennial College continues to enhance its applied research portfolio by attracting \$7 million in funding in 2017, a significant increase that places Centennial seventh in Canada according to Research Infosource’s annual ranking of Canada’s Top 50 research colleges.



Georgian Grad Takes Career to New Heights

BARRIE – December 11, 2018 – Scott Groh has been helping to shape the aviation industry for more than 30 years. Having grown up in the small Ontario town of Port Elgin on the shores of Lake Huron, he admits that he began his aviation journey with very little experience with aircraft.



“I was 20 years old before I even set foot in a real jet,” says Scott. “The opportunity to study aviation and expand my worldview was very exciting.”

As a student in the program’s very first Aviation Management intake, he credits Georgian’s three co-op placements for providing him the extensive fieldwork, which helped him gain real, hands-on experience and build invaluable relationships in the industry.

“Because of the co-op, I landed directly in my field and it put the foundation in place for my entire career,” says Scott.

After graduating in 1989, he went on to work in executive sales for Ad Opt technologies, where he helped to introduce some of the first airline crew management optimization software to airlines around the world.

Scott now works as Vice President of Crew Resources with WestJet Airlines. In this role, he oversees a dynamic operating schedule, which spans 11 time zones and includes more than 120 aircraft. As a member of WestJet’s senior executive team, one of Scott’s priorities is helping the Canadian airline expand operations throughout the Americas, Caribbean and Europe.

Prior to WestJet, he spent 14 years in the Middle East, working in leadership roles with Gulf Air, Etihad Airways and Qatar Airways. Scott held leadership positions at a time when these airlines were pursuing aggressive expansion plans, and helped to establish them as global players in the airline industry. Under his direction and planning, he oversaw the introduction of the Airbus A380 –

the world's largest passenger aircraft.

Scott was also a leader during some very challenging moments in the airline industry. While working as the Manager of Crew Resources with Gulf Air, he worked on logistics for emergency evacuation flights during the 2006 Israel-Hezbollah War in Lebanon, and his leadership has helped shape policy in the post-9/11 era.

Scott is often invited to speak at industry events and conferences, and accepts the opportunity to share his extensive industry knowledge whenever possible.

Wherever his career takes him next, he notes, "The square root of my success started with Georgian College."



Canadian Astronaut Chris Hadfield Reveals He's a Man of Many Talents at Engineering Conference

TORONTO – November 8, 2018 – Community members were treated to an inspiring and insightful talk by world-renowned astronaut Chris Hadfield on November 2.

Hosted by the George Vari Innovation Conference (GVIC), "Beyond the Horizon: The Hadfield Experience" featured the Canadian space commander to motivate and guide attendees to becoming changemakers in society. The event was produced by the Faculty of Engineering and Architectural Science in collaboration with the

Ryerson Engineering Student Society and the Ryerson Leadership Lab.



Photo by Dave Leross

Hadfield is the first Canadian to walk in space, has flown two space shuttle missions and served as commander of the International Space Station. He announced his retirement in July 2013, ending a 35-year career as a military pilot and astronaut.

By Antoinette Mercurio



What is the Role of Microspace Companies in the NewSpace Revolution?

TORONTO – December 10, 2018 – Ever since Space Flight Laboratory (SFL) opened its doors 20 years ago at the University of Toronto Institute for Aerospace Studies (UTIAS), innovations in microspace technologies have led to one satellite revolution after another.

Today, the satellite industry is in the midst of the NewSpace revolution, dominated not by satellite developers, but by service

providers. Racing to offer space-based Earth imaging, communications, connectivity, and/or monitoring services (to name a few) at viable price points, these NewSpace ventures have taken the extraordinary step of bringing small satellite manufacturing operations inhouse.



With the NewSpace revolution hitting its stride, the question has been posed: What role, if any, will microspace developers like SFL and other small satellite manufacturers play in this new era? We believe the answer to this question will be driven by the need for innovation and timing.

When SFL was established in 1998, microsatellites existed but were still considered novelties with limited practical utility due to a lack of attitude control technologies. Our lab was created to break through the microsatellite utility barrier with development and 2003 launch of a 57-kilogram space telescope for Canada called MOST.

No sooner had the microsatellite market begun heating up than people naturally started asking what could be done with even smaller platforms — cubesats and nanosatellites. At SFL, we soon found ourselves working on the envelope pushing CanX program, in which we developed high performance attitude control and autonomous formation flight technologies for use with sub-10

kilogram platforms no bigger than shoeboxes.

The barrier to practical and financially viable nanosatellite utility had been broken, and another era in microspace had begun.

NewSpace may be considered a spin-off from “microspace,” where small satellites are being manufactured not as end products but as platforms to provide space-based services. These integrated companies directly manage larger verticals, including the marketing and sales of the services as well as construction and operation of the satellites. NewSpace companies are data service providers that keep manufacturing inhouse as a way of controlling costs. Indeed, its business models are predicated upon stringent cost-effectiveness in highly competitive markets.

Have NewSpace ventures displaced the need for smallsat developers like SFL whose product is the satellite itself?

We don't believe so — at least not in the long term. The simple reason is the smallsat developer business model is built around innovation, not manufacturing. Innovation — the ability to develop a succession of smaller satellites, each more advanced than the previous - is what has allowed SFL and other microspace developers to thrive.

The challenge to the NewSpace service providers will come from competition. As its manufacturing group churns out one satellite after another, a competitor will arrive on the scene with satellites that provide the same services, only better or less expensively. The

NewSpace company will have to innovate or die.

One option is to stand up an inhouse innovation team, but this is an expensive route that will undermine its cost-sensitive business model. NewSpace companies are likely to find it unnecessary to carry the cost of feeding a top-notch satellite design team if they don't need new satellite designs every year. In contrast, satellite design is what microspace companies do on a continual basis, for many different applications and mission challenges.

The need for innovation will grow with time. Eventually NewSpace companies may want to turn to proven microspace organizations where innovation is an everyday occurrence. This can only happen if microspace organizations also make changes to its business models and adapt to a different set of needs that embodies NewSpace. So, there is work to be done by both NewSpace companies and microspace organizations to achieve mutual benefit.

Microspace organizations themselves must develop new approaches that bridge its bespoke, labor intensive formulas with semi-automated or automated mass manufacturing. SFL and other developers of smaller satellites will have to shift some of our revenue stream away from manufacturing because NewSpace organizations will keep mass production of satellites inhouse.

With lower manufacturing profits from NewSpace relationships, microspace developers will need to re-write contracts so that revenues are paid for the innovation itself,

not the construction of satellites. Under this scenario, NewSpace companies will compensate for innovation in the form of prototypes and then pay reasonable licensing fees for each satellite manufactured according to the newly developed design.

Overall, we view the burgeoning NewSpace business not as a competitor, but as a new revenue source that will complement the traditional — and growing — market for smaller satellites that yield fast returns on investment. At SFL, we expect to continue playing an important role in NewSpace and whatever satellite era comes next.

By Robert E. Zee, PhD, director at Space Flight Laboratory's Microsatellite Sciences and Technology Centre at the University of Toronto Institute for Aerospace Studies.

New Early-career Professorships Accelerate Innovation in Engineering Education and Research

TORONTO – November 20, 2018 – Twenty-seven U of T Engineering assistant professors have been appointed to early-career professorships across three new programs for tenure- and teaching-stream faculty members. The professorships, created by Dean Cristina Amon, will enhance research in emerging areas and practices in engineering education across the Faculty.

The new programs are the Dean's Spark Professorships (DSP), Catalyst Professorships (DCP) and Emerging Innovation in Teaching Professorships (DEIP). The appointed professors were

selected for their demonstrated commitment to several of the priorities outlined in the Faculty's 2017-2022 Academic Plan.

"Our professors are pioneering emerging research and designing new engineering education pedagogies that are a model for other universities around the world," says Amon. "These professorships will further accelerate their innovative research and teaching, and enhance their ability to deliver outstanding educational experiences for our students."

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Recipients of the DCP have served at least four years in their appointment. They are awarded an annual grant of \$75,000 per year over three years. Jonathan Kelly (UTIAS) earned the DCP to enhance his research and teaching in robotics.

"Robotics is growing exponentially and our students are at the forefront of this exciting field," says Kelly. "The DCP will help to ensure that we have the ability to equip our students with an unparalleled set of technical skills, which will position them as leaders in the discipline."

Read the [full article](#).

U of T Engineering Faculty Named Canada Research Chairs

TORONTO – November 13, 2018
– Professors Angela Schoellig (UTIAS) and Piero Triverio (ECE) have been awarded new and renewed Canada Research Chairs (CRC), respectively, by the Canadian federal government. The

announcement was made by The Honourable Kirsty Duncan, Minister of Science and Sport, at the University of Toronto's St. George Campus.



The Honourable Kirsty Duncan, Minister of Science and Sport, takes a closer look at Professor Angela Schoellig's "robotic swarming" drones, which are designed to be self-contained units that can communicate and observe its closest-neighbour robots and make decisions based on its own observations. Photo by Tristan McGuirk

"The chairholders we are celebrating today are leaders who are improving our depth of knowledge, strengthening Canada's social fabric and helping to train the next generation of researchers," said Duncan. "People like Professor Angela Schoellig, whose impressive robotics work we are shining a spotlight on today."

Schoellig, who was named the Canada Research Chair in Machine Learning for Robotics and Control, brought along several types of flying robots — also known as drones — to showcase to Duncan and other attendees. "I'm very honoured to receive this recognition, which will enable me and my team to do fundamental research at the intersection of machine learning, artificial intelligence and robotics," she said. "We hope to use machine

learning to make robots more capable and safer, to be used to advance our society."

As the head of U of T Engineering's Dynamic Systems Lab and associate director of the Centre for Aerial Robotics Research and Education (CARRE), Schoellig conducts research combining robotics, controls and machine learning. Her goals include enhancing the performance and autonomy of robots by enabling them to learn from past experiments and from each other. She was also recently named a Vector Institute Faculty Affiliate, an initiative that brings together leading researchers in deep learning, machine learning and artificial intelligence (AI) from across Ontario.

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Read the [full article](#).



York University Research to Start with Canadian Astronaut in Space

TORONTO – November 28, 2018
– Canadian Space Agency astronaut David Saint-Jacques is launching to the International Space Station (ISS) on Dec. 3, and soon after his arrival, some important research from York University Professor Laurence Harris will begin. This effort could one day help research in the areas of Parkinson's disease, stroke recovery, damaged organs, aging and remote robots used for surgery.



Harris is leading a virtual reality experiment, some equipment for which recently travelled to the ISS on NASA's Northrop Grumman's commercial resupply mission. While Harris will remain on earth, his research will investigate the effects of microgravity on astronauts' perception of their motion.

"It is vital for us to understand how we perceive information in space," said Harris, a professor of psychology in the Faculty of Health and director of York's Centre for Vision Research. "We want to see how going on long space flights will impact an astronaut's perception of motion. Our ultimate goal is to develop a model of an astronaut's perception of motion and body position and how the perceived distance to objects changes in space."

The experiment is a collaboration with the Canadian Space Agency. It is aptly named VECTION, which is the feeling that you are in motion caused by seeing the visual scene moving, even while you are immobile.

The VECTION research team is led by Harris, and includes Professors Michael Jenkin and Robert Allison from the Department of Electrical Engineering & Computer Science in York's Lassonde School of Engineering, as well as postdoctoral student Nils Bury and graduate student Meaghan McManus. They want to learn how visual information creates the feeling of self-motion in weightlessness.

The teams also wants to examine whether astronauts' perception of their surroundings is affected by weightlessness, and create a model of how space impacts the way we process visual information. Their experiment may enhance medical research focused on finding potential treatments for diseases, enhancing medical procedures and improving the quality of life for people who are sick.

"This experiment may be the missing piece of the puzzle to help us better understand disorders that affect movement and posture like Parkinson's disease," said Harris. "Virtual reality applications may help people recovering from a stroke or with damage to the sense organs that help with balance. Perhaps this research will give us deeper knowledge of the effects of aging on perception or how to improve technologies like remotely operated robots used in surgery."

The experiments will take place aboard the ISS and will be supported by control experiments conducted on Earth at York. Saint-Jacques will be the first crew member to take part in the experiment.

While in space, each astronaut will do three virtual reality tasks focused on three areas of study: the perception of orientation after accelerating motion, the perception of self-motion and the perception of distance. Each experiment will involve the astronauts being lightly held in a restraint system to stop them from drifting into the walls of the ISS while wearing a virtual reality head-mounted display (HMD), ear plugs and a neck brace to keep their head steady. The HMD will be attached to a laptop computer by means of a cable and they will indicate what they perceive using a finger mouse.

Harris and his team need results from seven astronauts, which will take two to three years to collect. The team will then analyze their findings to answer the important questions about the effects of space on perception that are being asked by the VECTION space mission.

MUSEUM NEWS

CANADIAN WARPLANE HERITAGE



www.warplane.com

Nothing new to report.

NATIONAL AIR FORCE MUSEUM OF CANADA



airforcemuseum.ca

Nothing new to report.

CANADIAN AIR AND SPACE CONSERVANCY

[formerly Canadian Air & Space
Museum]

www.casmuseum.org

On the Move to the New Home



TORONTO – December 4, 2018 –

On the morning of Monday, December 3, 2018, the collection's full-scale AVRO Arrow Replica was prepared for shipment to the collection's new home at Edenvale.



Three heavy tow motors lifted the Replica while the nose gear was replaced with an iron support used for the earlier moves: under the guidance of Vince Malfara (CASC). It was lifted onto a flatbed trailer, then driven out of the secure zone of the Pearson property to the staging area. The Replica left for Edenvale at 12 midnight.

It arrived in Edenvale about 5am on Tuesday, December 4. The lifting of the Replica off of the trailer and lowering to the ground by large crane truck (provided by Abrams Towing) was filmed by the TV program "Heavy Rescue 401" (Discovery Canada) for possible broadcast at a later date.

MATCOM re-attached the nose

gear. All fixtures (cradle, iron support for nose) are now stored with the Replica at Edenvale in a weather-proof hanger.

Plans are for the Replica to be moved inside a weather sealed hanger at Edenvale by Wednesday, December 5. On the same day at PIA, Mx Aerospace Services will assist with access to the tail, wing tips and weapons pack: to be loaded onto a flatbed truck for shipping to Edenvale for storage with the Replica.

All photos by Terry Ward, CASC

Former Toronto Aerospace Museum Secures New Airport Home

TORONTO – November 14, 2018

– After seven years circling the skies in search of a safe haven, the former Toronto Aerospace Museum has finally touched down with its historic aircraft collection at Edenvale Aerodrome (airport code CNV8), some 100 kilometres (63 miles) northwest of Toronto.

The first truckloads of aircraft and artifacts started to arrive at Edenvale in early November and the museum's full-scale Avro Arrow replica will move from Toronto Pearson International Airport to Edenvale at a later date.

This is good news in Canada's air and space heritage community since it confirms that the non-profit museum has overcome major existential threats and can now focus on the future.

"The circumstances demanded that we focused on asset conservancy as the core mission of the museum, knowing the unlikelihood of securing viable and

stable display space in the short term,” said Ian McDougall, the chairman of the museum.

As the museum collection moves to Edenvale, the museum has been rebranded as the “Canadian Air & Space Conservancy.”

Edenvale is an ideal site to display the museum collection and host special events again. The airport has three runways (up to 4,000 feet in length) and is already home to two aviation heritage groups.

The museum recognizes that its future success will depend on partnering with similar community and national organizations such as museums in Ottawa and Trenton. In future, it will make artefacts from the collection available to other like-minded organizations and other venues on a loan or exchange basis, expand its aircraft, artefact and archive collection, and resume aircraft restoration activities once facilities become available.

By Kenneth I. Swartz

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