CANADIAN AERONAUTICS AND SPACE INSTITUTE

CASI TORONTO FLYER

MAY 2019, Volume 26 #5

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

The next season of CASI Toronto Branch meetings will start in **September**. See you then!

Watch our Facebook page for information about CASI Toronto Branch meetings.

THERE IS A $5 CHARGE FOR NON-MEMBERS

CASI ASTRO

Click for more information.

PRIOR CASI BRANCH EVENTS

The **Toronto Branch Annual Dinner Meeting** was held on May 4, 2019. The wine was generously sponsored by long-standing member Tony Burgess and his company **TDM Technical Services**. In addition, ten students were able to attend for free, thanks to the very generous sponsorship of **Gary Elfstrom (FCASI)**, who is eager to increase student participation in CASI.

Our guest speaker, **Dr. Hugh Liu**, discussed some of the research being done on drone navigation and control at UTIAS. One of the challenges is to enable a drone to navigate by visual references, so that it can find its way home again if it loses its primary GPS navigation function. Two case studies were presented, showing how drones can identify hot spots in wildfire detection, and how they can monitor the growth of toxic algae in bodies of water.

The **CASI Toronto Branch Student Awards** were also presented to the top graduating students in the local aerospace programs. Students are recognized for academic excellence, leadership skills among their peers, and active participation in extracurricular and community activities. The 2019 award recipients were:

- Uswah Zahid (Ryerson University);
- Adam Tetzlaff (Seneca College);
- Bennett Leong (University of Toronto);
- and Tetiana Sitiugina (York University).

CASI Toronto Branch wishes them all the best in their future endeavours.

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:

Chairman
Chris Hayball
Vice Chair & Flyer Editor
Gillian Clinton
Councillor
Alex Tsoulis
Treasurer
Bhavik Mody
Education Chair
Amir Masoud Tahvilian
Secretary
Fatemeh Mousavilar

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

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.

LOCAL NEWS

Registration for Airside Tours is Open!

Registration for our public Airside Tour program is now open. Our Airside Tour program is free and allows our neighbours to get a sneak peek at what goes on behind-the-scenes at Canada's busiest airport!

Please note that all participants must be 10 years of age or older and everyone must have a valid government-issued photo ID.

REGISTER

Beyond Horizons CWIA 2019 Conference, June 19-22, Ottawa

The **2019 Canadian Women in Aviation Conference** is shaping up to be an exciting event with many speakers already confirmed. The conference opening keynote speaker is Dee Brasseur, one of the first two female RCAF CF-18 fighter pilots in the world, along with Jane Foster.

Karen McCrimmon, Member of Parliament for Kanata-Carleton, will be the gala keynote speaker. She was the first female Navigator in the RCAF, and the first woman to command a CF Air Force Squadron: 429 Transport Squadron in Trenton, Ontario. Currently, Karen is Parliamentary Secretary to the Minister of Public Safety and Emergency Preparedness.

Ashley Barker, Search and Rescue Technician, was one of two women among the eight graduates this year from the Canadian Forces School of Search and Rescue, CFB Comox. The Air Force Para-Rescue specialists are responsible for saving lives of Canadians caught in a variety of situations over land and sea. Since she was young, Ashley had a passion for adventure and medicine and now she is in a position to render medical care to casualties.

Elizabeth Cameron, Vice President, Labour Relations, NAV Canada, will be giving a seminar on negotiating for women. She is responsible for developing labour relations strategies and mandates for collective bargaining.

Bill Tibbo, a corporate clinical consultant and disaster management specialist, will also be giving a seminar on critical incident stress management. His unique approach to crisis response emphasizes the human element of leadership and guides organizations to put people first.

Earlybird registration, including student rates, is available until April 1. Click here for further details on conference registration and accommodations.

Many thanks to Victor Ujimoto, Ph.D, Professor Emeritus at the University of Guelph for this notice.

Editor's Note: If you attend an interesting lecture or hear about upcoming events, please share with the CASI membership.

INDUSTRY NEWS

BOMBARDIER

Bombardier Celebrates Donation of a CRJ200 Aircraft to Centennial College

TORONTO – April 25, 2019 – In parallel to the opening of Centennial College Downsview Campus Centre for Aerospace and Aviation, Bombardier Commercial Aircraft announced today the donation of a CRJ200 aircraft to the Centennial College Aviation Program at its new campus based in Downsview, to be used in the education and training of the future generation of aerospace professionals.

The CRJ200 is the first one of its kind to grace the Centennial College's Downsview facility hangar, it is also the biggest plane as well as the first ever commercial aircraft to be received at the site. The aircraft will allow students not only to have a hands on experience with CRJ Series technology, but also to learn on a bigger scale, furthering the level of expertise made available through the Centennial College Aviation Program.

"Advancement and innovation have always been at the forefront of Bombardier's values, says Fred Cromer, President, Bombardier Commercial Aircraft, which is why we are honored to present Centennial College with this CRJ200 aircraft. This donation represents not only an opportunity for the Toronto aerospace sector to grow but rather for the whole of Canadian Aerospace, which will surely benefit from it today. We are at a crucial moment in Canada where the aerospace industry is building up steady growth and the demand for skilled workers is also rising. At Bombardier, we want to do anything we can to help and improve present and future generations of aerospace workers in Canada."

This donation will further reinforce the collaboration of Centennial College and the Downsview Aerospace Innovation and Research Consortium (DAIR) aimed at servicing the Greater Toronto Area. The DAIR Hub projects to strengthen the Toronto, Ontario, and Canada aerospace sector by increasing collaborative research and development, accelerating technology adoption, helping small and medium sized enterprises scale-up, and addressing the projected skills shortage in the industry through training and re-training.

The DAIR Hub is expected to help Canada stay competitive defending its leadership position on the world stage and propel Canadian aerospace forward. This initiative will also continue Downsview's tradition of world-class aerospace and aviation, a legacy that began with De Havilland nearly a hundred years ago.

About DAIR

The Downsview Aerospace Innovation and Research Consortium (DAIR) is an association of all of the large aerospace companies and leading post-secondary education institutions from the Greater Toronto Area (GTA), who have come together with the joint mandate of developing an Aerospace Hub at Downsview Park in Toronto, Ontario.

DAIR news and information is available at dairhub.com and our Twitter @DAIR_Hub.

CSA ASC

The CSA Awards Funding to Prepare Canadian Companies, Universities and Students for Future Missions to the Moon

April 17, 2019 – The Canadian Space Agency (CSA) has awarded funding worth $700,000 to a Canadian firm and two universities for projects that will enable Canadian firms to advance key technologies and develop their own potential, while offering training opportunities and hands-on experience for students and young professionals.

These projects will be part of the CSA's Lunar Exploration Analogue Deployment (LEAD), which will position Canada for potential future contributions to lunar rover missions.

Grants awarded under the Flights and Fieldwork for the Advancement of Science and Technology (FAST) - LEAD Announcement of Opportunity

University of Western Ontario:

- CanLunar - A Canadian Lunar Sample Return Analogue Mission $135, 275
- Field Deployment of in situ Learning Algorithms for Classifying Planetary Materials $153,670

Contribution awarded under the Space Technology Development Program - LEAD Announcement of Opportunity

Canadensys:

- LEAD Capability Demonstration $249,963

Maritime Microsatellite ESAIL to Test the Waters as Launch Contract Is Signed

CAMBRIDGE, ON – May 9, 2019 – The first commercial microsatellite developed under ESA's SAT-AIS programme for tracking ships, called ESAIL, has passed another milestone. On 9 May its Canadian operator exactEarth signed the launch service agreement with Arianespace.

Peter Mabson of exactEarth (left) and Geoffroy Legros of Arianespace sign the launch contract for ESAIL

ESAIL is part of ESA's Partnership Projects and has been developed to enhance the next generation of space-based services for the maritime sector. The spacecraft will track ship movements over the entire globe as it orbits the planet.

Satellite coverage is essential as about 90% of global trade takes place on the oceans. It opens the door to enhanced safety, tracking ships and route provisions for industry, government and maritime authorities.

Ships of 300 tonnes or more in international voyages, cargo ships of 500 tonnes or more in local waters and all passenger ships irrespective of size are mandated by the International Maritime Organization to carry Automatic Identification System (AIS) equipment

Terrestrial AIS antennas needs direct line of sight with the vessels, however, so the system is limited by the curvature of the Earth. Satellite automatic identification systems, or SAT-AIS, have no such restrictions and can receive messages from ships on the open ocean, enabling authorities to follow vessels' movements throughout their entire voyage.

The ESAIL satellite is built by LuxSpace for the exactEarth constellation of AIS satellites, through an ESA's Partnership Project together with the Luxembourg Space Agency and other ESA member states.

ESAIL's AIS receiver provides advanced antenna beamforming and ground signal processing capabilities. The satellite needs rigorous testing before launch to ensure it can provide this always-on service.

The satellite flight model has completed its environmental tests in Centre Spatial de Liège in Belgium, where it was exposed to mechanical vibration testing, simulating the violence of a rocket launch, as well as to the extreme temperatures and vacuum simulating the near Earth orbital environment.

The satellite is going through the final steps to be ready for launch in August.

Peter Mabson, chief executive of exactEarth, said: "We are looking forward to adding ESAIL to our industry-leading global maritime satellite constellation, which now consists of more than 60 in-orbit high performance satellite assets. The capabilities on ESAIL will allow us to continue to advance the state-of-the-art in maritime vessel tracking and data services, and will pave the way for future capabilities. I would like to thank ESA and LuxSpace and their satellite manufacturing team for their accomplishments in producing this leading-edge microsatellite."

Stephane Lascar, Head of Telecommunication Satellite Programmes at ESA, said: "ESA's Partnership Projects offer the most appropriate scheme for private and public entities to de-risk investments and answer market needs. They maximise benefits to industry, thanks to ESA's efficient co-management tailored to commercial practices. ESAIL demonstrates once again ESA's capacity to federate operator, industry and small and medium-sized enterprises around challenging programmes, achieving competitive leaps forward and economic impact. I should like to thank our partners and participating states for their

trust and close cooperation."

Marc Serres, Chief Executive of the Luxembourg Space Agency, said: "This maritime microsatellite built in Luxembourg by LuxSpace, in partnership with ESA and exactEarth, demonstrates how a private company and the European Space Agency can closely work together to develop a new commercial product. ESA has been a key partner in developing the technical skills needed to compete in a highly demanding commercial space market. As a European leader in commercial space, Luxembourg is following a unique space strategy focused on creating an attractive ecosystem for NewSpace companies and innovative space entrepreneurs."

ESAIL is a pioneering project for LuxSpace, who are also developing a multi-purpose, modular platform called Triton-X. Triton-X will build on the manufacturing and testing heritage gained by LuxSpace through ESAIL, using New Space-style off-the-shelf components to deliver a fully fledged satellite within months.

Thomas Görlach, Chief of the Executive Board at LuxSpace, said: "ESAIL is a major milestone for us as a microsatellite solution provider. It enabled us to build and integrate a sophisticated microsatellite while using commercial off the shelf components and thus reducing time for testing and launch qualification. The emerged synergies paved our way towards commercial space. We have gained very valuable experiences and knowledge through ESAIL which serve as inputs for our next milestone: the Triton-X platform."

Kepler Hires Former Inmarsat Chief Strategy Officer Patrick McDougal

TORONTO – April 30, 2019 – Kepler Communications announces today that former Chief Strategy Officer at Inmarsat, Patrick McDougal, joined the company this month as a strategy advisor to support its business units. McDougal is a veteran business strategist within the satellite telecommunications industry with over 30 years of senior experience working for global leaders in the sector such as Inmarsat (29 years) and Intelsat (4 years).

Before joining Kepler, McDougal was a member of the executive management team at Inmarsat where he led a number of initiatives including the acquisition of various companies, securing EU-wide spectrum licenses that advanced Inmarsat's market strength, and global oversight of the company's overall corporate business development efforts.

"We are very happy to welcome Patrick to our team. The experience he has within the satellite industry is of great value to a company the age and size of Kepler, so we are excited to bring him on board," said Mina Mitry, CEO of Kepler Communications. "With his substantial network and expertise, along with Kepler's technology and talented team, we will further reinforce and grow our market position as we continue to develop new and exciting partnerships together."

''As a Canadian who has worked overseas all my professional life, it is a pleasure to have the opportunity to work with the Toronto-based Kepler team – smart, highly motivated and ambitious,'' said Patrick McDougal. ''I am delighted to contribute my experiences as I believe that they have what it takes for long-term success. I'm happy to be with them for the next stage of the journey.''

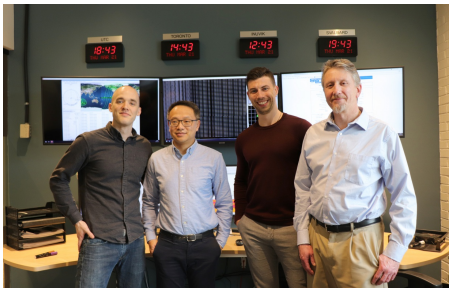
Kepler Communications and Magellan Aerospace Sign Letter of Intention to Fly Innovative Smart Radiator Device on Satellite Mission

TORONTO – April 16, 2019 – Kepler Communications, a Canadian satellite telecommunications provider, and Magellan Aerospace Corporation have signed a Letter of Intention to fly an innovative Smart Radiator Device (SRD) on Kepler's third satellite, scheduled for launch later this year. The unique SRD, designed to significantly improve temperature management on-board future satellites, is being developed by MPB Communications ("MPB") in partnership with Magellan Aerospace.

This innovative SRD technology is being developed as part of a technology development program with the goal to improve its technology readiness level by eventually operating in the space environment. Kepler intends to be the first to use this technology as part of their satellite's thermal control hardware suite before the

end of 2019.

The SRD radiator design has a unique property in which its effectiveness in emitting or retaining heat (its "emissivity") changes with temperature. Heat dissipation increases at elevated temperatures and reduces at lower temperatures. The tunable radiator keeps the spacecraft within tighter temperature bounds and reduces the need for survival heaters when the spacecraft is cold. The SRD's properties are highly desirable for space applications, especially for communication satellites where the payloads tend to rapidly heat up at the time of transmitting signals (up to 80°C) and quickly get colder (down to -20°C) when dormant.



Jeffrey Osborne, Kepler; Eric Choi, Magellan; Jared Bottoms, Kepler; Corey Mack, Magellan

With the SRD, Kepler will be able to keep the spacecraft in the "Goldilocks Zone": not too hot, not too cold. "We are looking forward to seeing this new technology in action and how it will benefit next-gen satellite platforms moving forward," says Jared Bottoms, Kepler's Lead Systems Engineer.

"Magellan is looking forward to continuing the development of the SRD with MPB, and is excited about the upcoming flight opportunity with Kepler" says Corey Mack, Space Business Unit Leader at Magellan.

MHI Canada Aerospace, Inc. Announces New President and CEO

TORONTO – April 1, 2019 – MHI Canada Aerospace, Inc., a recognized Tier 1 heavy aerostructures (Wing / Centerfuse) group company of Mitsubishi Heavy Industries, announced today that Janet Wardle has been promoted to the position of President and Chief Executive Officer, effective immediately.

Ms Wardle has nearly 25 years' experience in aerospace, both Commercial and Defense. After graduating Queens University, with an Honours Degree in Mechanical Engineering, she joined an OEM in their Finance Department as an Industrial Engineer. She has held Senior Management roles in Change Management, Planning and Supply Chain, while simultaneously earning her MBA from the Rotman School of Business.

Her depth of industry knowledge and her proven ability to build high-performance teams will be key in growing MHICA's customer base. "Janet is a very enthusiastic and passionate leader who shares my core values and I am confident that she has the experience, skills and ability to lead us to the next level of operational excellence," said Chairman Mike McCarthy. "I'm excited to add that not only has Janet broken the glass ceiling at MHI Canada, but she becomes the first ever female president in any of the MHI Group Industry companies! A feat well earned. Congratulations, Janet."

In addition to her promotion, Janet is appointed as a Board Director to the MHICA Board of Directors. Mr. Satoshi Sawaguchi, General Manager and Program Manager, Bombardier, who has been a longtime proponent and supporter of MHICA, also will become a Director on the Board. Janet and Sawaguchi-san will be joining existing Board Directors Hirose-san, Executive Vice President of Commercial Aviation Systems, Senior General Manager, Commercial Airplanes Division, and Head of Nagoya Aerospace Systems Work and Hisano-san, Senior Executive Vice President and General Manager, Washington Office, MHI America.

Prior to her promotion, Janet was Vice President and General Manager at MHICA overseeing manufacturing, process and industrial engineering, quality, sourcing, procurement and logistics. She was responsible for implementing a massive, rapid and successful transfer of our supply chain for the wing and fuselage major assemblies from MHI Japan to MHI Canada.

"In the three years since joining MHI Canada, I have not only changed positions, I have grown as a leader. The team at MHICA has been remarkable. Together, we have on-boarded over 60 new suppliers, we have brought on 4 Major assembly packages, including Centerfuse and Centerwing box. We continue to look forward to a bright future as we prepare to occupy a second, new building in October. I am looking forward to working together with MHI Japan and MHI America to build a better and brighter future."

porter

Robert Deluce Appointed Executive Chairman at Porter Airlines as Part of Leadership Reorganization

TORONTO – April 10, 2019 – The executive team of Porter Airlines is reorganizing to ensure continuity for its immediate and future development.

Effective immediately, Robert Deluce, Porter's founding president and CEO, assumes the new role of executive chairman, enhancing his existing responsibilities as a member of the board of directors, while staying engaged in Porter's core business strategies. He also remains as the company's accountable executive for Transport Canada.

This change is supported by a series of realigned executive responsibilities. Michael Deluce now takes on president and CEO duties. As a founding team member at Porter, Michael was instrumental in defining Porter's successful business plan, commercial and brand strategies, and has been a key part of realizing that vision in the role of executive vice president and chief commercial officer.

Don Carty has been Porter's chairman of the board of directors since the company's founding and will continue in this role.

"A principle responsibility for a board of directors is ensuring orderly succession planning," said Carty. "This transition sees Robert become further involved at the board level, while allowing Michael and other senior leaders to oversee daily business activities. It is a combination of diverse experience and expertise that will serve Porter well in meeting our needs today."

"My focus as executive chairman is on supporting our reorganized executive team, while still being active in certain key business areas," said Robert Deluce. "It's important for me to be proactive in giving our leadership team even more direct responsibility for setting Porter's course and I'm confident that the changes announced today are consistent with the vision we created when the airline launched in 2006."

Michael Deluce has also been appointed as a member of Porter's board of directors.

"It is a rare opportunity to be part of the development of a company from the outset and now take on the president and CEO position more than a decade later," said Michael Deluce. "We have an exceptional team in place, from our seasoned management group to our dedicated team members, who believe in what we're doing to distinguish Porter as a special airline. We'll work hard to build on this strength."

Leadership Structure

With Michael's appointment, Kevin Jackson moves to the position of executive vice president and chief commercial officer. Kevin has worked closely with Michael, most recently as senior vice president and chief marketing officer. In addition to his current responsibilities of marketing, communications, sales, packaged products and information technology, Kevin will also oversee revenue management, airport operations, catering, learning and development, call centre and customer relations. He continues reporting directly to Michael.

Paul Moreira remains Porter's chief operating officer and also becomes executive vice president. Paul's responsibilities focus closely on enhancing overall operational reliability in the critical areas of safety, flight operations and maintenance. He oversees safety, pilots, cabin crew, SOCC, technical operations, including maintenance, Porter FBO, and facilities, while reporting directly to Michael.

Additional roles on Porter's executive team are unchanged.

Jeff Brown remains executive vice president and chief financial officer, with responsibilities for finance, people and culture, government relations and legal. Jeff also now reports directly to Michael.

Lawrence Hughes remains senior vice president, people and culture, shaping Porter's culture and leading strategies that enhance team member training and engagement. Lawrence reports directly to Jeff Brown, with indirect reporting to the president and CEO.

ACADEMIC NEWS

RYERSON UNIVERSITY

Generous Gift Establishes $200,000 Scholarship for Women in STEM

TORONTO – March 12, 2019 – Ryerson is pleased to announce a new scholarship that will open doors for women pursuing careers in science, technology, engineering and math (STEM). The Savitri & Anju Virmani Scholarship for Women in STEM was created thanks to a generous $100,000 gift from Ms. Anju Virmani, chief information officer at CargoJet and expert in the field of information technology.

Anju Virmani and Ryerson University President and Vice-Chancellor Mohamed Lachemi. Photo taken by Jae Yang.

A $10,000 scholarship will be awarded each year to four full-time female students who are at the top of their class and entering the fourth year of an undergraduate STEM program. An annual ceremony to celebrate recipients will create an ecosystem of support for women, giving them the opportunity to meet leaders in the field, pursue mentorship opportunities and build their network.

"When you educate someone, you change a lot more lives than just that one person's," Anju said. "You change their family's life, their community's and, hopefully, one day they pay it forward to keep the circle going."

Her generosity will be matched by the President's Awards to Champion Excellence (PACE), a priority scholarship program initiated by President and Vice-Chancellor Mohamed Lachemi for students from underrepresented groups at Ryerson University.

"We are grateful to Anju Virmani for her generous support of the Savitri & Anju Virmani Scholarship for Women in STEM," says President Lachemi. "Her vision for a scholarship program that includes mentorship and networking for the recipients will propel the success of high-potential female students pursuing a career in science, technology, engineering and math."

Growing up in India, Anju's family placed a strong emphasis on education. Her grandparents supported the education of girls at a time when there were few professional women. Her grandfather, an educator, homeschooled all eight of his children. Her mother, Mrs. Savitri Virmani, became a math teacher and passed the same values on to her children.

Shortly after coming to Canada in 1975, Anju started a new career in information technology and soon had two successful IT consultancies. She has served on several high-profile boards, including the Toronto Transit Commission (TTC), the Toronto Local Health Integration Network (LHIN) and, under Prime Minister Stephen Harper, the Advisory Council for National Security (ACNS). In many of these settings, she noticed she was one of two or three women, significantly outnumbered by male colleagues and counterparts.

After providing her expertise to startups at the DMZ and witnessing Ryerson's work to promote access to underrepresented groups in society, she became convinced the university was the right home for this new award to support the success of women pursuing careers in STEM-related fields.

The inaugural recipients of the new Savitri & Anju Virmani Scholarship for Women in STEM will be selected this fall.

Innovation Takes Flight with Ryerson Helium

TORONTO – March 5, 2019 – Instead of hopping into your car and getting stuck in traffic, imagine powering up your own personal aircraft and flying right over it.

The Ryerson Helium team has been working together for more than a year to create a VTOL (vertical take off and landing vehicle) for the GoFly challenge. Photo: Conceptual rendering by Ryerson Helium.

This is the vision of Ryerson Helium, a team of 30+ students who have been working together since January 2018 to design and build a VTOL (vertical take-off and landing) Personal Aerial Vehicle.

The vehicle is the team's entry in the GoFly, external link challenge, an international Boeing-sponsored competition, which will award $2 million in prizes to the winning personal flying devices.

"It's been a great help to have Ryerson and the Design Fabrication Zone on our side. We don't think we would have been able to do this anywhere else," said Amin Ismail, mechanical engineering student and operations lead for the team. "The DFZ has offered us resources, space to build, as well as a lot of mentorship and guidance. We've been able to talk to them about whatever we need."

The team has also had a range of support from other areas. The Qt Company provided the team with the same software tools used by Tesla, so the team could create a unique dashboard for the Helium vehicle. Other corporate partnerships provide the team with software licenses in exchange for logo representation on their vehicle.

"Dr. Seyed Hashemi, aerospace professor, Dr. Filippo Salustri, associate chair of the mechanical department, and Dr. Paul Walsh, aerospace chair, have all been really supportive of us from the beginning," said team lead Kevin Kasa, an aerospace engineering student. "When the project first kicked off, we approached Dr. Hashemi, and from day one he supported us. And when you think about it, we're a bunch of second years, what do we know, but he was like, 'Yes, go ahead, I'm confident you guys will succeed.' And we probably wouldn't have done it without that support, so it was very important."

Lior Saprikin, aerospace engineering student and marketing and outreach lead for the team, agrees.

Leaders of the seven Ryerson Helium sub-teams: (back row, from left) Lior Saprikin (marketing and outreach lead), Danyal Chaudhry (guidance, navigation and control lead), Hani Hakeem (user experience co-lead); (front, from left) Sai Sanketh Poosarla (power lead), Aleeza Hashmi (guidance, navigation and control specialist), Amin Ismail (operations lead), Kevin Kasa (overall team lead). Photo: Ryerson Helium.

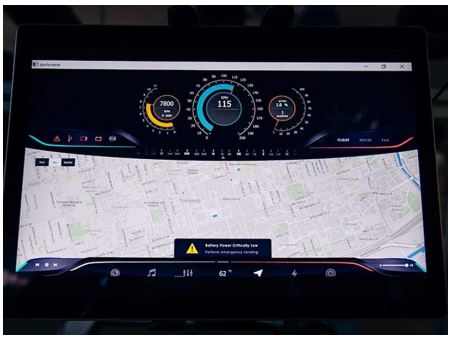
"It's been hard for us, we've had many challenges, but we've been able to go to faculty members and ask them for mentorship, space, advice, and they're so open to it. They love seeing that students can apply what they're teaching in class," said Saprikin. "I think Ryerson is the best school to really support innovation."

The team is divided into five design sub-teams – structure, propulsion, power sub, user experience, and guidance, navigation and control – and two non-design teams, outreach and business planning, with a special focus on safety and the experience of the user, including music selection and comfortable, ergonomic seating.

"We want to make something that people actually want to get into," said Ismail.

The innovative spirit of Ryerson Helium extends to its interdisciplinary approach. Five of the seven faculties at Ryerson are represented on the team, with members from the Faculty of Engineering and Architectural Science (FEAS), Faculty of Communication and Design (FCAD), Faculty of Science, Ted Rogers School of Management, and graduate students participating.

"That's one of the things we love the most and we try to emphasize as much as possible. Collaboration and diversity with the different faculties and groups within Ryerson," said Kasa. "We try to align the work with what they're good at, what they like doing and what they think will benefit them in the future in terms of their academic career and personal growth."



Close up of GPS navigation system of Ryerson Helium flying vehicle

The GoFly competition requires entries to be safe, quiet, ultra-compact, user-friendly and capable of carrying a single person for a distance of 20 miles without refuelling or recharging. The Ryerson Helium design fulfills all these requirements, and after a year of hard work, the team unveiled their half-scale model to a mesmerized crowd at the Student Learning Centre on January 15.

"During the event, a number of professors told us that, 'Even if you guys stop now, you should be very proud of your accomplishments, it's been an incredible learning experience for all of you'," recalled Kasa, "And it has. Even if operations were to stop today, the whole experience

would influence our future careers."

"I think every member would be proud of their work," said Saprikin. "We've been able to apply a lot of the knowledge we learned in class and, additionally, learn things that will never be taught in a classroom."

The final GoFly "Fly-off" will take place on the U.S. West Coast early in 2020 and, to prepare, the Ryerson Helium team is now working on building the full-size vehicle, which they'll test in September – by flying it.

"From the days of early science fiction, people have thought about having a flying car, but it was never possible," said Saprikin. "And now, maybe, we're approaching that."

Space Flight Laboratory to Build HawkEye 360 Next-Gen Microsatellite Cluster for Commercial Radio Frequency Geolocation

TORONTO – March 27, 2019 – Space Flight Laboratory (SFL) has been awarded the prime contract to develop the next generation cluster of formation-flying microsatellites for HawkEye 360 Inc. of Herndon, Va. The HawkEye Constellation, comprised of multiple clusters of three satellites each, is the first of its kind to detect and geolocate radio frequency (RF) signals for maritime, emergency response, and spectrum analysis applications.

SFL built the platforms and integrated the HawkEye 360 Pathfinder cluster which was launched into low-Earth orbit in December 2018 and commissioned early this year. The three formation-flying Pathfinder microsatellites have successfully demonstrated geolocation of VHF, emergency position-indicating radio beacon (EPIRB), automatic identification system (AIS) and marine radar signals.

"Through the development, launch and commissioning of our Pathfinder cluster, SFL demonstrated exceptional ability to deliver the solution we required," said HawkEye 360 Founder and Chief Technology Officer Chris DeMay. "Their customer-first approach and engineering prowess resulted in the first-of-its-kind RF analytics we are generating today. We are proud to continue partnering with SFL on the development of our next set of spacecraft as we expand on-orbit capacity and enhance our capability to meet customer demands."

SFL is developing the next-generation cluster to service more sophisticated payloads as HawkEye 360 broadens its detection and geolocation capabilities. The cluster will incorporate SFL technologies that make on-orbit formation flying possible. Most prominent of these technologies is the high-performance attitude control system developed by SFL to keep micro- and nanosatellites stable in orbit.

"The microsatellite bus selected by HawkEye 360 for the next-gen cluster is one we developed specifically to address the economics of commercial space activities," said SFL Director Dr. Robert E. Zee.

SFL satellite technology was selected for the HawkEye 360 Pathfinder mission due to the importance of formation flying by multiple satellites for successful RF signal geolocation and analysis. The relative positions of each satellite in the constellation must be known to accurately geolocate the transmission sources of the radio frequency signals. SFL first demonstrated affordable on-orbit formation control with smaller satellites in the 2014 Canadian CanX-4/CanX-5 mission.

"We have developed compact, low-cost formation flying technology for commercial exploitation that is unmatched by any other satellite developer," said Zee.

Established in 1998 as a self-sustaining specialty lab at the University of Toronto Institute for Aerospace Studies (UTIAS), SFL has built 25 nano- and microsatellites with nearly 100 cumulative years of successful operation in orbit to date.

John Moores Appointed York Research Chair in Space Exploration

TORONTO – May 3, 2019 – Nine emerging and established researchers across the University will join the York Research Chairs (YRC) program, York University's internal counterpart to the national Canada Research Chairs (CRC) program, which recognizes outstanding researchers.

Included in this prestigious list is Lassonde School of Engineering Professor John Moores, an internationally recognized planetary scientist and space engineer whose research explores the atmospheres and surfaces of other worlds. His research group has been a member of the science and operations teams of five ESA and NASA space missions to Mars and Titan, and has been awarded the NASA group achievement award on 16 occasions. Moores has published 63 papers garnering more than 4,950 citations. He was elected as a Member of the College of New Scholars in the Royal Society of Canada in 2018.

MUSEUM NEWS

CANADIAN WARPLANE HERITAGE

www.warplane.com

Virtual Reality Experience - BBC 1943 Berlin Blitz

Until August 31, 2019

9 am – 5 pm daily

It was one of the most ambitious and dangerous reports made during World War II. In September 1943, BBC war correspondent Wynford Vaughan-Thomas boarded Lancaster 'F for Freddie' with his recording engineer and a microphone. Their destination: Berlin.

The BBC has created this masterfully animated Virtual Reality Experience using Vaughan-Thomas' original recording, which vividly captures the danger of the bombing raid. This unique cinematic experience transports visitors inside the bomber as the crew endures endless flak and a night fighter attack in their journey to the heart of Nazi-occupied Europe.

Presented in immersive Virtual Reality, this powerful experience is the closest that one can get to truly experiencing the bravery demonstrated by Bomber Command, the median age of which was only 22 years old. As described by Vaughan-Thomas upon his return, it was "the most beautifully horrible sight I've ever seen."

This exhibit is available for those aged 13 and up. Click here for more information.

Cipher Decipher

May 25 to September 29, 2019

9 am - 5 pm daily

Pssst...want to know a secret?

One way to safely share secret information is through encryption - which means converting your message into something only the intended recipient can understand. For as long as we've had secret information, individuals and organizations have encrypted and analyzed encrypted communications. One way people encrypt their secrets is through ciphers that replace the original message with other letters, numbers, words or symbols. From schoolyard gossip to military plans, ciphers keep secrets out of the wrong hands.

Cipher Decipher is an interactive exhibition exploring the past and present of communications cryptology - what it is, how it works and how it affects our lives. See an authentic Enigma cipher machine or try your hand at logic puzzles and games to see if you have what it takes to work in the field of cryptology!

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

Nothing new to report.

LOCAL CASI CORPORATE PARTNERS

Altair

BOMBARDIER

CAE

CSA ASC

MAGELLAN AEROSPACE CORPORATION

MDA

Ontario Centres of Excellence
Where Next Happens

Pratt & Whitney Canada
A United Technologies Company

RYERSON UNIVERSITY

TDM TECHNICAL SERVICES

UTIAS