

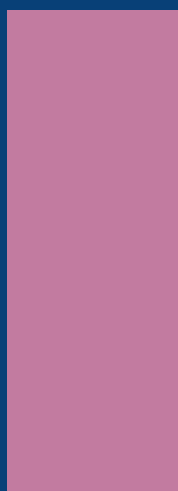


MONTREAL SPACE SYMPOSIUM

SPEAKER SCHEDULE

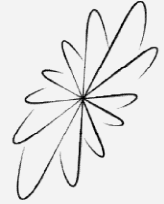
PROGRAMME

DAY 2 JOUR 2



THE CANADIAN SPACE PROGRAM AT A CROSSROADS

***PAST, PRESENT, & FUTURE OF CANADIAN SPACE
PASSÉ, PRÉSENT, ET FUTUR DE L'ESPACE AU CANADA***



**MONTREAL SPACE SYMPOSIUM
OCTOBER 2017**

With the launch of Alouette 1 in 1962, Canada became the third country to have a satellite in space. Subsequent successes include robotic contributions to the Space Shuttle and International Space Station, satellite missions such as SCISAT-1 and CASSIOPE, and a high-profile astronaut corps that recently welcomed its two newest members. Next year, Canada looks forward to the launch of the RADARSAT Constellation Mission and the six-month ISS expedition of David Saint-Jacques. Beyond 2018, the Canadian space program is at a crossroads, awaiting a new space strategy and follow-on space plan to provide the policies and funding needed to grow our space capabilities in the years ahead.

***DAY/JOUR 2
ROOM/SALLE A
9:30 - 10:00***

ERIC CHOI

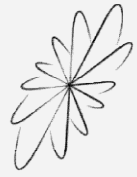
***SENIOR BUSINESS DEVELOPMENT MANAGER AT
MAGELLAN AEROSPACE***



Eric Choi is senior business development manager at Magellan Aerospace. In his career, he has worked on an instrument for the Phoenix Mars Lander, the Canadarm2, the RADARSAT-1 satellite and the MOPITT instrument on the Terra satellite. An alumnus of the International Space University, he holds a B.A.Sc in engineering science and an M.A.Sc in aerospace engineering, both from the University of Toronto, and an MBA from York University.

BEFORE SCIENTISTS. SPACE NEEDS SOCIAL SCIENTISTS!

***SPACE LAW & SPACE SOCIAL SCIENCES
DROIT & SCIENCES SOCIALES SPATIALS***



**MONTREAL SPACE SYMPOSIUM
OCTOBER 2017**

In the past, the pace of development on Earth and now increasingly in the outer space is beyond comprehension and introspection of the collective global human society. Recently, as we entered the epoch of Anthropocene we have learnt, that over the time the humankind in itself has become a collective geophysical force acting against the nature resulting into crossing of crucial tipping points, endangering its survival on the only habitable planet, Earth.

As we venture out into outer space, with feasible plans of resource mining, terraforming and space colonization, fundamental questions arise, pertaining to what kind of precedents do we set for the future. Do we rely and act on the same socio-political paradigm of the Earth, where race for resources led to colonization, industrial revolution followed by globalization to surface an unjust, unequal and most importantly, environmentally unsustainable global society. Or do we re-think the whole socio-political and developmental paradigm, thinking profoundly for the first time a non-anthropocentric value system giving intrinsic value to the nature and the cosmos.

Against this backdrop, I challenge the “human as dominant specie” value system and argue (in light of space exploration and exploitation) a crucial reset of socio-political, developmental and environmental paradigm to make a case for “Before Scientists, Space needs Social Scientists”.

BAYAR GOSWAMI

DOCTORAL STUDENT, INSTITUTE OF AIR AND SPACE LAW AT MCGILL UNIVERSITY



Bayar Goswami is a Doctoral student at the Institute of Air and Space Law, McGill University (IASL). He finished his LL.M. in Air and Space Law from the IASL where he wrote a thesis titled “Theorizing Cosmic Environmental Law” involving Cosmology, Environmental Ethics, the Anthropocene epoch vis-à-vis the International Environmental Law and Space Law. He is a recipient of the Erin J.C. Arsenault Fellowship awarded by McGill University for both his LL.M. and DCL and additionally was also awarded the Assad Kotaite Graduate and Postdoctoral Fellowship awarded by the United Nations’ International Civil Aviation Organization. He has worked as an Indian delegate to represent India’s legal position at the 39th Triennial Assembly Session of the United Nations’ International Civil Aviation Organization held in October, 2016. Further, he is involved as a Research Assistant in important research projects undertaken at the IASL, like the International Study on Global Space Governance, Manual on International Law Applicable to Military Uses of Outer Space and the Space Security Index, 2016 & 2017 (SSI). He is passionate about advocating Space Environmentalism and triggering dialogues which challenge the developmental paradigm, particularly at the onset of modern space age. Recently, he gave a TEDx Talk on Space Environmentalism in February, 2017 and is keen on interactive platforms to engage in conversations involving social sciences of the outer space.

While not researching about Space Law, Bayar loves playing and collecting percussion instruments. Random curiosity and questions on Space Law thrill him for which he can be contacted anytime at bayar.goswami@mail.mcgill.ca or be contacted in person at Institute of Air and Space Law, McGill University, Montreal, Canada.

***DAY/JOUR 2
ROOM/SALLE B
9:30 - 10:00***

**DEFENCE SPACE RESEARCH - TODAY AND
TOMORROW / RECHERCHE POUR LA DÉFENSE
SUR L'ESPACE - D'AUJOURD'HUI À DEMAIN**

**PAST, PRESENT, & FUTURE OF CANADIAN SPACE
PASSÉ, PRÉSENT, ET FUTUR DE L'ESPACE AU CANADA**



MONTREAL SPACE SYMPOSIUM
OCTOBER 2017

Canada will modernize its space capabilities and will take steps to protect these critical assets against sophisticated threats, while continuing to promote the peaceful use of outer space. We will assume a more assertive posture in the cyber domain by hardening our defences and by conducting active cyber operations against potential adversaries in the context of government-authorized military missions. Cyber operations will be subject to all applicable domestic law, international law, and proven checks and balances such as rules of engagement, targeting and collateral damage assessments.

Le Canada modernisera ses capacités spatiales et prendra des mesures pour protéger ces ressources essentielles contre les menaces sophistiquées tout en continuant à promouvoir l'utilisation pacifique de l'espace extra-atmosphérique. Nous adopterons une posture plus délibérée dans le cyber domaine en renforçant nos défenses et en menant des cyber opérations actives contre d'éventuels adversaires dans le contexte de missions militaires autorisées par le gouvernement. Les cyber opérations seront soumises à toutes les lois nationales applicables, au droit international et aux garde-fous éprouvés tels que les règles d'engagement, le ciblage et les estimations des dommages collatéraux.

MELISSA REYES

CANADIAN ARMED FORCES, CENTRE OF DEFENCE RESEARCH AND DEVELOPMENT CANADA

Joining the military in 1989 as a Communications and Electronics Engineering (CELE) Officer, Major Reyes has over twenty-seven years of experience as a military officer in the Canadian Armed Forces (CAF), with assignments around the world and throughout Canada. Her various experiences have given her a sound knowledge of space and space-related systems, operational requirements, security, and communications. She has been involved in all aspects of management throughout her career. Some of her previous assignments include working at the Canadian Space Agency on the RADARSAT Constellation Mission satellites, Director General Space in satellite communications, 8 Wing Air Communication and Control Squadron for mobile airfield communications, and the North Warning System Office on the northern coastal radars.

Major Reyes was recently named the Associate Centre Director at the Ottawa Research Centre of Defence Research and Development Canada (DRDC). Formally the Group Leader for Space Systems and Operations at DRDC Ottawa, her team was developing Space Situational Awareness and Space Mission Assurance for the Canadian military.

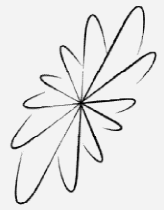
Major Reyes received her Master of Sciences Degree from the University of Colorado, specializing in Remote Sensing. In 2012, she completed the International Space University Space Studies Program. She has co-authored articles that have been published in international, scientific and space journals and continues to act as a scientific reviewer for international journals. Wanting to promote the positive influence of diversity and different cultures, Major Reyes was a member of the Visible Minority Advisory Group at the Canadian Space Agency and is still a member of the Defence Visible Minority Group based out of National Defence Headquarters. She is honoured to be a part of the Canadian Armed Forces Outreach Programme, promoting military careers for women and diverse cultures.



**DAY/JOUR 2
ROOM/SALLE A
10:00 - 10:30**

A VISION FOR CANADIAN SPACE EXPLORATION

***PAST, PRESENT, & FUTURE OF CANADIAN SPACE
PASSÉ, PRÉSENT, ET FUTUR DE L'ESPACE AU CANADA***



MONTREAL SPACE SYMPOSIUM
OCTOBER 2017

The Canadian Space Exploration Workshop organized by CSA in November 2016 brought together the communities of space astronomy, planetary science, and space health to discuss current and future missions prospects and develop priorities. Two clear issues arose: a lack of resources to maintain our legacy of excellence in space exploration and a lack of process for choosing where to invest those resources. In response to this and in consultation with stakeholders from science and industry, we developed a white paper articulating a vision for Canadian space exploration. I'll summarize the key points of the white paper and talk about our subsequent efforts to promote this vision.

***DAY/JOUR 2
ROOM/SALLE B
10:00 - 10:30***

SARAH GALLAGHER

ASSOCIATE PROFESSOR AT UNIVERSITY OF WESTERN ONTARIO

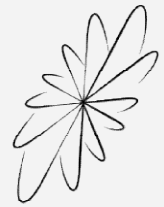


Sarah Gallagher is an expert on the growth of supermassive black holes, focussing on multiwavelength and theoretical investigations into their winds. She was an early member of two Chandra instrument teams and won one of the first NASA Spitzer postdoctoral fellowships (hosted at UCLA). Her research has been recognized with an Ontario Early Career Researcher Award and a Western University Faculty Scholar Award. She has served on more than 10 time allocation panels for space observatories, and on the users' committees for the Hubble Space Telescope and two space data archives. She was a Director on the board of the Canadian Astronomical Society and a member of the CSA-CASCA Joint Committee on Space Astronomy.

SMALLSAT CONSTELLATIONS: DISRUPTIVE CHANGES ALONG THE VALUE CHAIN

PAST, PRESENT, & FUTURE OF CANADIAN SPACE

PASSÉ, PRÉSENT, ET FUTUR DE L'ESPACE AU CANADA



MONTREAL SPACE SYMPOSIUM
OCTOBER 2017

The space sector is currently undergoing one of the most dynamic periods of all times. Over the last years new commercial actors have emerged introducing innovative concepts from manufacturing to services, largely based on low-cost smallsat constellations. They have the value proposition of bringing the cost down of solutions, making space more affordable and accessible to end-users. With disruptive changes in the market and technological environment, the commercial space sector faces now unique challenges but also tremendous opportunities introduced by these new actors.

The proposed presentation will provide an overview of the smallsat market. This will include an overview of the number of satellites launched, main programs, applications targeted by these new solutions (e.g.: global connectivity (Satcom), high-frequency change detection (Earth Observation)), as well as what are the disrupting changes that these new smallsat solutions are introducing across the value chain.

DAY/JOUR 2
ROOM/SALLE A
10:30 - 11:00

NATALIA LARREA BRITO

CONSULTANT AT EUROCONSULT

Natalia Larrea Brito is a Consultant at Euroconsult since 2016 based in Montreal. She supports consulting activities and research reports focusing on Earth observation and satellite communications.

Prior to joining Euroconsult, Natalia worked as a systems engineer at MDA Corporation in Montreal. She specialized in the design of satellite payloads based on current and future technologies supporting the Business Development Proposal team. In addition, she has worked at the European Space Agency (ESA) within the Herschel Space Observatory mission. Her research at ESA focused on the development of analytical methods to generate galaxy catalogs from photometric observations. Natalia has also worked at NASA Ames as part of the NASA Academy program. There, she worked on a new mission concept for Mars exploration and participated in the design of a space bioreactor to conduct biological experiments on-board the International Space Station.

Natalia holds a Master in Aerospace Engineering from McGill University, a Bachelor and Master in Telecommunications Engineering from Universidad Alfonso X El Sabio (Madrid, Spain) and a Diploma in Astronomy and Planetary Science from the Open University UK. She is also a graduate of the International Space University (ISU) Space Studies Program. During her studies she has covered applications focusing on space engineering, technologies and utilization of space-based assets. She has won several academic awards, including the Satellite Society Professionals International (SSPI) scholarship award.

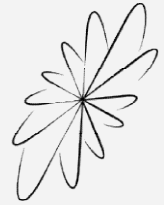
Born in Madrid (Spain) she enjoys travelling, cooking tapas, wine, and live music. She is also a firm supporter of education, getting involved in her spare time in different activities to engage future generations into the space field.



HOW TO GROW BLACK HOLES AND NEUTRON STARS

SPACE SCIENCES

SCIENCES DE L'ESPACE



MONTREAL SPACE SYMPOSIUM
OCTOBER 2017

Black holes, neutron stars, and other compact objects grow via merger and accretion. Hot gas and energetic jets offer a vital electromagnetic view of these otherwise dark objects, and new discoveries of gravitational waves emitted during their mergers are rapidly ushering in the era of multi-messenger astrophysics. I'll discuss some of the cool things we know about these exotic objects, the telescopes and experiments that allow us to tease out their secrets, and a few of the open questions that will guide future inquiries.

***DAY/JOUR 2
ROOM /SALLE B
10:30 - 11:00***

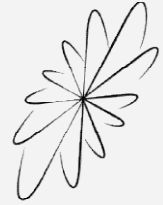
DARYL HAGGARD

PROFESSOR OF PHYSICS AT MCGILL SPACE INSTITUTE



I am an Assistant Professor of Physics at McGill University in the McGill Space Institute. I study active galactic nuclei (accreting supermassive black holes) and their host galaxies, the Galactic center and Sgr A*, and accretion-driven outflows using multi-wavelength and time domain surveys.

MONTREAL À LA CONQUÊTE DE L'ESPACE



MONTREAL SPACE SYMPOSIUM
OCTOBER 2017

PAST, PRESENT, & FUTURE OF CANADIAN SPACE

PASSÉ, PRÉSENT, ET FUTUR DE L'ESPACE AU CANADA

Présentation de la place tenue par Montréal dans le secteur spatial et qui a positionné le Canada comme un joueur stratégique de ce secteur sur l'échiquier Mondial.

***DAY/JOUR 2
ROOM/SALLE A
11:00 - 11:30***

BÉATRICE AGOSTINI

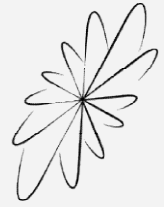
*GESTIONNAIRE DU MARKETING ET DES
COMMUNICATIONS, SYSTÈMES SATELLITAIRES, MDA*



I am an enthusiastic, highly qualified Marketing Communication professional with excellent understanding of high-technology environments, used to working across different countries. I have 10 years of experience within Software & IT Services B2B & B2C marketing and communication functions. I enjoy developing new ways to attract new customers and delight existing ones. I believe that success, whether personal or that of the organisation, comes from perseverance and cooperation with others. I embrace change and am stimulated by continuous learning.

SEEING GRAVITY AND THE (INVISIBLE) UNIVERSE WITH PULSARS

*SPACE SCIENCES
SCIENCES DE L'ESPACE*



MONTREAL SPACE SYMPOSIUM
OCTOBER 2017

Albert Einstein's greatest achievement is the general theory of relativity -- the modern view of gravitation -- and the confirmed predictions that arise from it. Such predictions include time warps, the bending of light, and black holes! The most elusive and intriguing prediction, however, is the existence of gravitational waves (GWs), which are periodic ripples of space and time. Until last year, we could only "see" gravitational waves indirectly by observing the decaying orbits of "radio pulsars", which are the remnant corpses of supernova explosions.

The era of GW astronomy has finally begun, with last year's announcement of a direct GW detection using the ground-based LIGO instrument. Various instruments are now being built to observe these waves, from the ground and in space. I will talk about how radio pulsars serve as a natural GW "detector", and will be crucial for observing GWs from the inspiral of supermassive black holes in the distant Universe.

**DAY/JOUR 2
ROOM/SALLE B
11:00 - 11:30**



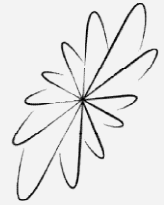
EMMANUEL FONSECA

POST-DOCTORAL RESEARCHER AT MCGILL UNIVERSITY

I work as a pulsar astronomer in the McGill Space Institute, and I am a member of the CHIME and NANOGrav collaborations. I obtained a Ph. D. in astronomy at the University of British Columbia in Vancouver, BC, and hail from Boston, Massachusetts, USA.

MICRO-MACHINING AN ELECTROSPRAY ION THRUSTER FOR CUBESATS

***SPACE ENGINEERING
GENIE DE L'ESPACE***



MONTREAL SPACE SYMPOSIUM
OCTOBER 2017

CubeSats, a type of micro-satellite, are gaining attention as an economical and cost-effective satellite platform for governmental, commercial and academic institutions. The major obstacle to further development of this versatile platform has been the lack of compact propulsion systems that harness on-board power. This presentation will propose a viable approach based on prior research from literature.

***DAY/JOUR 2
ROOM/SALLE A
11:30 - 12:00***

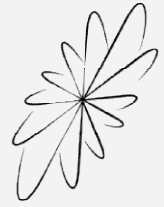
BEN GEORGE

***GRADUATE STUDENT AT ÉCOLE POLYTECHNIQUE DE
MONTRÉAL***



I graduated from the University of Waterloo with a Bachelor of Applied Science in Chemical Engineering. I worked at ARLANXEO, a joint venture between Lanxess and Saudi Aramco until April 2017, after which I joined Prof. Fabio Cicoira in the Department of Chemical Engineering as a graduate student. My project involves fabricating an electrospray ion thruster for the 2020 Polyorbite CubeSat mission.

THE HIDDEN X-RAY UNIVERSE



*SPACE SCIENCES
SCIENCES DE L'ESPACE*

MONTREAL SPACE SYMPOSIUM
OCTOBER 2017

X-ray astronomy gives us a window into the highly energetic, sometimes violent, parts of our universe. We can peer into the heart of our galaxy and probe the inner parts of a super nova. I will give an overview of the X-ray telescopes used today, what it takes to build one, and the astronomy they reveal.

***DAY/JOUR 2
ROOM/SALLE B
11:30 - 12:00***

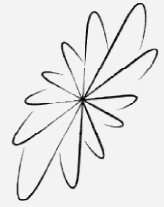
MELANIA NYNKA

POSTDOCTORAL RESEARCH FELLOW AT MCGILL SPACE INSTITUTE

Melania completed her PhD at Columbia University, where she helped construct part of the X-ray space telescope NuSTAR. Now as a Postdoctoral researcher at the McGill Space Institute, she continues to explore the wonderful (and sometimes messy) science of X-ray astronomy.

INTRO TO SPACECRAFT ANTENNA DESIGN, ASSEMBLY & TEST

*SPACE ENGINEERING
GENIE DE L'ESPACE*



MONTREAL SPACE SYMPOSIUM
OCTOBER 2017

An introduction to spacecraft antenna design, assembly & testing.

*DAY/JOUR 2
ROOM/SALLE A
12:00 - 13:00*



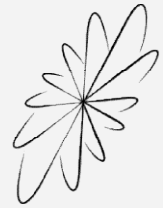
GIUSEPPE MENNITTO

SPECIALIST ENGINEER AT MDA

Giuseppe is a specialist engineer at MDA in St Anne de Bellevue.

HIGH-CONTRAST IMAGING BALLOON SYSTEM (HICIBAS)

***SPACE SCIENCES
SCIENCES DE L'ESPACE***



**MONTREAL SPACE SYMPOSIUM
OCTOBER 2017**

The High-Contrast Imaging Balloon System (HiCIBaS) is a first-generation balloon-borne telescope project that has four objectives: develop and test a custom low-order wavefront sensor (LOWFS), measure and gather data on wavefront instabilities and errors at high altitudes in the visible spectrum, develop and test a sub-milli-arcsecond pointing system, and give high-altitude flight heritage to the LOWFS, deformable mirror (developed by Iris AO) and EMCCD cameras (provided by NuVuCameras). It is being developed by Université Laval, along with numerous collaborators, and will be launched under the CSA's STRATOS program in August of 2018 from Timmins, Ontario. The "big picture" goal of this project is to characterize the atmosphere and validate the instruments, techniques and concepts used so that they can be employed for future exoplanet-studying missions.

***DAY/JOUR 2
ROOM/SALLE B
12:00 - 12:30***

DEVEN PATEL

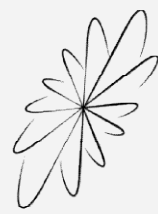
MASTER'S STUDENT AT UNIVERSITÉ DE LAVAL



Deven is pursuing a Master's degree in Physics from Université Laval and is a graduate from Concordia University in Mechanical Engineering, specializing in Aerospace and Propulsion. During his time at Concordia, Deven completed internships at Bombardier Aerospace and CAE and largely worked on the validation and verification processes of, both, the C-Series aircraft family and CAE simulators. Deven was also a member of Space Concordia for two years: he was a member of the Rocketry division, co-led the society's first-ever high-altitude balloon project, and assumed the role of VP of Special Projects.

DOWN TO EARTH SPACE ENGINEERING

**SPACE ENGINEERING
GENIE DE L'ESPACE**



MONTREAL SPACE SYMPOSIUM
OCTOBER 2017

An important aspect of national space programs is their ability to provide technological spin-offs that will benefit human earthly pursuits. Neptec will present two current projects that illustrate the potential Space technology has for benefiting humanity in a very direct way.

Through a 13 year development program undertaken in collaboration with the Canadian Space Agency (CSA), Neptec has developed a substantial expertise in laser-based machine vision. The latest iteration of this LiDAR work, the mini-LiDAR or mLDR, is of a size that supports integration to autonomous vehicles, specifically cars. This miniature sensor will help accelerate what is an already very fast moving technology for self-driving cars. In 2013, Neptec led an industry-academia consortium in the definition of an astronaut healthcare concept for exploration class missions. The CSA called the concept the Advanced Crew Medical System (ACMS). Since 2013, Neptec and its partners have pursued the development of the ACMS through work for the CSA and ESA (European Space Agency) as well as healthcare institutions such as St. Mary's Hospital Foundation in Montreal. The terrestrial version of the ACMS, called the Autonomous Medical System (AMS), offers the potential to revolutionize healthcare in the 21st century by:

Solving the access to primary care problem in the First World;

Solving the shortage of primary care in the Third World; and

Making First World healthcare affordable and sustainable for Whole World

**DAY/JOUR 2
ROOM/SALLE A
14:00 - 15:00**

MICHEL A. LORTIE

**MANAGER OF BUSINESS DEVELOPMENT AT NEPTEC
DESIGN GROUP**

Michel A. Lortie is a professional engineer registered in Ontario and Québec. A graduate of Mechanical Engineering at the University of Ottawa, he has worked for forty (40) years as a computer and systems designer. His design activities have led to implementations in all segments of a modern industrial economy including manufacturing, process control, aerospace, pharmaceutical and healthcare industries. His most recent project, involved the design and development of a multi-platform decision support system to assist physicians, nurses, patients and informal care givers in the diagnosis, treatment and maintenance of patients suffering from Chronic Obstructive Pulmonary Disease (COPD) and anxiety and depression. This ground-breaking technology was developed in cooperation with McGill University and the Veterans Affairs department of the US Government.

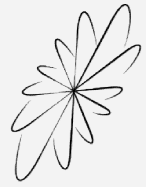
MICHAEL KHOR

MECHANICAL ENGINEER AT NEPTEC DESIGN GROUP

Michael Khor is a graduate of Mechanical Engineering at Concordia University, he has worked on nanosatellites (3U Cubesats) during his undergraduate years which has lead him to working in the space industry. Currently, he is working at Neptec Design Group as a Mechanical Engineer, designing, analysing and testing spaceflight hardware. Michael is working on flight programs such as Orbital ATK's Commercial Resupply missions to the International Space Station and the European Space Agency's Proba 3, a precise formation flying demonstration mission. Other activities include research and development of next generation LiDARs.

INTERNATIONAL SPACE STATION ROBOTICS: A SUCCESS STORY

***PAST, PRESENT, & FUTURE OF CANADIAN SPACE
PASSÉ, PRÉSENT, ET FUTUR DE L'ESPACE AU CANADA***



**MONTREAL SPACE SYMPOSIUM
OCTOBER 2017**

The International Space Station (ISS) is the most complex technical endeavour that humanity has ever undertaken. Maintaining such a complex structure required new techniques and technologies. One of the technologies that's been used with immense success has been space robotics. The Mobile Servicing System (MSS) has been used not only to assemble the ISS but is now being increasingly used to maintain the aging ISS.

Over the years, more and more tasks that would originally have been done via Extravehicular Activities (EVAs) are now being performed using ISS robotics systems. This growing experience base has allowed the ISS program to be both more efficient and to push the envelope of what can be accomplished robotically. Nowadays, all but a very small number of ISS robotic operations are commanded by personnel on the ground. Flight controllers on the ground perform the planning and execution of these operations.

***DAY/JOUR 2
ROOM/SALLE B
14:00 - 15:00***

DANIELLE CORMIER

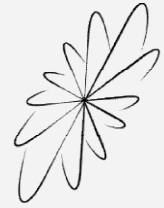
MISSION CONTROLLER AT CANADIAN SPACE AGENCY



Danielle Cormier works for the Canadian Space Agency as a Mission Controller for the Robotics Systems of the International Space Station. She is one of the eight Canadian members of the NASA group that plans and executes operations for the Space Station Robotics systems. She also supported the Phoenix Polar Lander mission as a flight controller during its second month of operations on the surface of Mars. Having grown up looking at the stars and dreaming of outer space in Amos, Quebec, Danielle got her bachelor's degree in Mechanical Engineering from the École Polytechnique de Montréal. She subsequently started at the Canadian Space Agency as a co-op student, which led to the position that she currently occupies. She also holds a Master's Degree in Engineering Management from the Université de Sherbrooke.

COLLABORATIVE INNOVATION: ISSUES, CHALLENGES AND WINNING PRACTICES. THE EXAMPLE OF THE AEROSPACE INDUSTRY

*OTHERS
AUTRES*



MONTREAL SPACE SYMPOSIUM
OCTOBER 2017

"The Consortium for Research and Innovation in Aerospace in Quebec (CRIAQ) and the Consortium for Aerospace Research and Innovation in Canada (CARIC) are organizations whose missions are to facilitate collaboration of researchers from the aerospace industry, academia and research centres, and to launch initiatives whose primary purpose is to promote responsive, impactful R&D. This lecture will insist on the distinctive characteristics of these models and their impact on Quebec and Canada's aerospace innovation culture. The lecture will also emphasize on the issues, importance and challenges of industrial cluster in collaborative innovation to accelerate the introduction of enabling and disruptive technologies, particularly in SMEs."

**DAY/JOUR 2
ROOM/SALLE A
15:00 - 15:30**

SOFIANE BENYOUCI

***PROJECT AND BUSINESS DEVELOPMENT MANAGER AT CARIC -
CONSORTIUM FOR AEROSPACE RESEARCH AND INNOVATION IN CANADA***



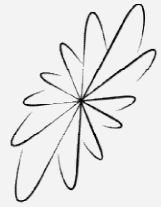
Sofiane Benyouci is Project and Business Development Manager for CRIAQ and CARIC which are respectively the Consortium for Aerospace Research and Innovation in Quebec and in Canada. He has been a member of the CRIAQ and CARIC team for over 5 years where he is active in scouting, networking, assembling and financing major collaborative innovation projects serving innovative aerospace companies. He excels particularly in the setting up of local and international strategic alliances, carrying innovating projects with high potential and assiduously supports their launch and progress until their success. Prior to joining CRIAQ and CARIC, Sofiane has worked as international project coordinator for a major French industrial cluster for advanced manufacturing technologies and as project manager for the Canadian Green Aviation Research and Development Network. Sofiane was also a research assistant for the Marshall Radar Observatory of McGill University.

Sofiane holds a Master in Industrial Engineering and a bachelor in Aerospace Engineering from Polytechnique School of Montreal. He also holds a diploma in technology innovation and commercialization management from the business school HEC Montréal. During his studies, Sofiane has developed an expertise in the digital transformation of aerospace companies.

Born in Algiers (Algeria), Sofiane is also a jazz musician and soccer player.

SUBORBITAL FLIGHTS, A NATIONAL APPROACH?

***SPACE LAW & SPACE SOCIAL SCIENCES
DROIT & SCIENCES SOCIALES SPATIALS***



**MONTREAL SPACE SYMPOSIUM
OCTOBER 2017**

At the time air and space law regimes have been conceived, in the XXth Century, the prospective of future activities embracing both regimes was not given much thought. However, today, the evolution of technology and the increase of commercial aviation and spatial activities, and mostly the arising of hybrid activities, have made the lack of uniformity and interaction between air and space law regimes worthy of attention. Particularly, future commercial activities such as suborbital flights will take place in both air space and outer space, making the choice of which legal regime to follow unclear and, thus, we are assisting to different solutions on this problem adopted by some space faring -but also non faring- nations, which are supported by divergent political positions. This situation is further complicated by the lack of a legal demarcation line between the air and the space. The study has the scope to explore the different legal solutions to this issue and the possibility for ICAO to incorporate suborbital flights in its regulatory regime.

***DAY/JOUR 2
ROOM/SALLE B
15:00 - 15:30***



ERMANN0 NAPOLITANO

STUDENT AT MCGILL UNIVERSITY

LL.M. Thesis student at the McGill University's Institute of Air and Space Law

UN LABORATOIRE DANS L'ESPACE : UNE INTRODUCTION AUX ÉTOILES NAINES BLANCHES



MONTREAL SPACE SYMPOSIUM
OCTOBER 2017

***SPACE SCIENCES
SCIENCES DE L'ESPACE***

For my thesis, I produced a catalog of the nearest white dwarf stars and their physical properties. To obtain such a catalog is not an easy task: it requires years of planning and observations using observatories across the continent, as well as meticulous image processing and data analysis with state-of-the-art models. In this presentation, we discover what are those stellar remnants that we call white dwarfs, what they can teach us about astronomy and physics and why finding them represents such a challenge.

***DAY/JOUR 2
ROOM/SALLE A
15:30 - 16:00***

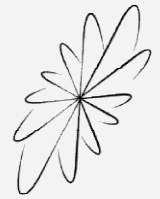
MARIE-MICHÈLE LIMOGES

MARIE-MICHÈLE LIMOGES SCIENCE AND EDUCATION
DIRECTOR AT COSMODÔME



Marie-Michèle Limoges obtained her Ph.D in stellar astrophysics from the Université de Montréal in 2014. Since then, she specializes in science communication for the Cosmodôme, where she is in charge of educational programs, museology and public outreach.

THE CASE FOR A TERRAN SPACE AGENCY



MONTREAL SPACE SYMPOSIUM
OCTOBER 2017

***SPACE LAW & SPACE SOCIAL SCIENCES
DROIT & SCIENCES SOCIALES SPATIALS***

***DAY/JOUR 2
ROOM/SALLE B
15:30 - 16:00***

Humanity today faces a grave number of space-based threats, both cosmological and anthropological: some threaten our way of life while others threaten our very lives. Surmounting these perils will require the concentrated and coordinated effort of all States, channelled towards the betterment of humanity. The manner in which we have attempted to address these threats to-date has been stifled by the isolationist structure of national space agencies and the inability to overcome longstanding political and legal obstacles. This presentation will investigate whether the creation of a global, international Terran Space Agency (tasked with solving six particular projects to safeguard human existence and improve the human condition) can be a method by which to overcome the legal barriers currently impeding progress. In particular, it will examine the value of a Terran Space Agency on the basis of whether it honours the equitable foundations of international space law.

This presentation will use as examples six current global space issues and demonstrate that the present shortcomings in solving these challenges are neither technological nor motivational but, in fact, legal and political. It will then investigate whether a Terran Space Agency (TESA) could provide a solution, within the existing legal framework, through which to address and solve the current problems. The significant challenges include: 1) remediating space debris; 2) undertaking space situational awareness and space traffic management; 3) preparing for and administering planetary protection; 4) exploiting the vast resources of outer space; 5) exploring and settling diverse planetary systems; and 6) searching for, understanding and communicating with extraterrestrial life forms. The presentation will use these examples to investigate whether a new international organization can tackle these and future issues appropriately.

ARAM DANIEL KERKONIAN

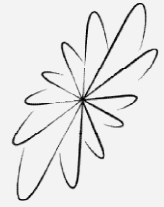
DCL CANDIDATE AT INSTITUTE OF AIR AND SPACE LAW, MCGILL UNIVERSITY



Aram Daniel Kerkonian is currently a DCL candidate at the Institute of Air and Space Law at McGill University. Aram works as a Research Assistant to the IASL and, in this capacity, has drafted space-related policy reports for the Government of Canada, edited book chapters on both air and space law and organized conferences in collaboration with the United Nations. Aram is also appointed as the IASL's representative to the US Federal Aviation Administration's Center for Excellence on Commercial Space Transportation. Aram holds a BA(H) from Queen's University and a JD from the University of Windsor. Aram is called to the Bar of Ontario and completed his articles as a judicial law clerk to the Ontario Superior Court of Justice.

HOW TO FIT THE UNIVERSE IN A CLASSROOM

*OTHERS
AUTRES*



MONTREAL SPACE SYMPOSIUM
OCTOBER 2017

In our fast-paced and rapidly changing world, we tend to overlook the importance of admiring what is above us - the ever-expanding universe. We, the Educational Outreach division of the McGill Space Systems Group, aim to attune Earth's inhabitants to the wonders of space. Since our group's liftoff, we have connected with over 300 young minds ranging from 6 to 17 years of age. We have covered various topics including gravity, the solar system, and the importance of satellite research. Through executing our mission, we have witnessed that space-related topics are not the easiest to comprehend, given their abstract nature. It is therefore imperative to value pedagogical approaches, and their improvement, as much as the content we wish to teach. We are going to share with you the approaches we have used as well as teaching philosophies that teachers can adopt to encourage any individual's contribution to humanity's advancements in space.

*DAY/JOUR 2
ROOM/SALLE A
16:00 - 16:30*

FELIX VALIN

EDUCATION DIRECTION AT MSSG



The Education division of the McGill Space Systems Group started as a small team of devoted undergraduate students, wanting to make a difference by teaching the importance of space. The diversity of backgrounds is a key element to our success and we are proud to show how blending education and technical expertise has let us achieve more than we ever hoped. After multiple presentations in classes, camps, and winning the CEEA 2017 Video Contest's first place, we are now more ready than ever to uncover and explain the true beauty of space and its exploration.

THE PERMISSIBILITY OF EXPLOITING CELESTIAL BODIES' WEALTH: A SPACE LAW PERSPECTIVE

***SPACE LAW & SPACE SOCIAL SCIENCES
DROIT & SCIENCES SOCIALES SPATIALS***



***DAY/JOUR 2
ROOM/SALLE B
16:00 - 16:30***

One of the goals of space law is to secure the use of outer space for the advancement of humankind. At the same time, technological developments towards space mining reveal that such endeavor can only be realized with the active participation of the private sector that would inevitably require either the a priori permissibility of commercial exploitation of space resources, or the a posteriori acceptance of it. However, one controversial question arises: How would it be possible to continue securing the use of outer space towards the advancement of humankind when the commercialization of substantive parts of the latter seems legally blocked due to the very nature of space law that prohibits appropriation of outer space parts. Such a question is directly linked to the issue of whether the time for New Laws as envisioned by New Space activities has arrived. This paper attempts to present the current legal framework that surrounds the exploitation of celestial bodies' natural resources and answer the aforementioned question on the basis of benefit-sharing mechanisms. Specifically, it asks whether benefit-sharing agreements would legitimize the exploitation/commercialization of space natural resources, and if so, how would this be legally feasible.

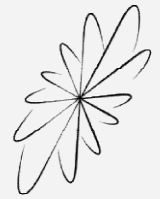
MARIA MANOLI

***2ND YEAR DOCTORAL STUDENT, INSTITUTE OF AIR AND SPACE LAW AT MCGILL
UNIVERSITY***



Maria Manoli is a doctoral student at the McGill Institute of Air and Space Law (IASL), where she is also an Erin J. C. Arsenault doctoral fellow in Space Governance, an R. E. Morrow fellow and a N. M. Matte fellow. She holds a Bachelor's Degree in Laws from the National and Kapodistrian University of Athens, two LL.M.s from the same University, in Civil Law and in Public International Law respectively, and a LL.M. from the IASL, during which she was also an Erin J. C. Arsenault Master's fellow in Space Governance. Maria is a registered lawyer at the Athens Bar Association, Greece, and has previously interned as a junior project manager at Secure World Foundation, clerked for the Athens Court of Appeals Prosecutor's Office, and been a trainee lawyer for the Council of State (Greece), and the Hellenic Competition Commission. Maria is also a research assistant for the IASL and has coached the McGill IASL space law moot court team for its participation in the M. Lachs Moot Court Competition for three years. She has often been judge for the Philip C. Jessup International Law Moot Court Competition and delivered a number of university lectures as well as dozens of presentations to conferences and workshops around the world. During the summer 2017 she was a participant in the 2017 Centre of the Hague Academy of International Law.

THE CASE FOR A TERRAN SPACE AGENCY



MONTREAL SPACE SYMPOSIUM
OCTOBER 2017

***OTHERS
AUTRES***

Students at the post-secondary level enter Introductory Astronomy courses with varied backgrounds, from no prior exposure (aside from Primary and Secondary curriculum) or backyard astronomers to budding Astrophysicists and Aerospace Engineers. The role of these courses is to share basic information, skills and possibilities (scientifically and career-wise), so that students who have an affinity for space sciences have a starting point to leap onto a career path. Traditional approaches use a historical evolution of information with relatively static learning outcomes. In the digital and social media age, most students have some exposure to recent discoveries, and more importantly they have access to information and current data that better represents the direction of space science they will experience. I will describe a novel approach that puts the direction and depth of the content covered into the students' control.

***DAY/JOUR 2
ROOM/SALLE A
16:30 - 17:00***

KARIM JAFFER

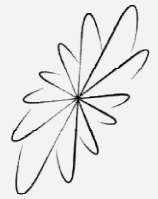
PROFESSOR OF PHYSICS AT JOHN ABBOTT COLLEGE



I have been at John Abbott College (JAC) since 2006, teaching a variety of Physics and Pathways courses, and began teaching the Introductory Astronomy course in 2016. I am an active researcher in Physics & Science Education, having served on several provincial projects in Math & Science education across the Secondary, Cegep and University levels. I have also taught in Physics, Mathematics, Education and Exercise Science at Bishop's University, in Physics at Carleton University and at Marianopolis College. I am an active member of the Royal Astronomical Society of Canada (RASC) - Montreal Centre.

CANADIAN COMMERCIAL SPACE OPPORTUNITIES

*PASSÉ, PRÉSENT, ET FUTUR DE L'ESPACE AU
CANADA*



MONTREAL SPACE SYMPOSIUM
OCTOBER 2017

Canada has opportunities to grow its space economy through multi-sector engagement, a unique international position, policy enhancements, technological innovation, miniaturization and more. Hear about sector insights, strategy, networks, and support in navigating the new space paradigm.

*DAY/JOUR 2
ROOM/SALLE B
16:30 - 17:00*

ALEC WENZOWSKI

*VICE PRESIDENT OF DEVELOPMENT AND PARTNERSHIPS, CANADIAN SPACE
COMMERCE ASSOCIATION*

Alec Wenzowski is a board member of the Canadian Space Commerce Association and serves as the Vice President of Development and Partnerships. He is a McGill alum, the President of MaxQ Canada, and a serial entrepreneur. From satellite data hackathons to founder networking events to Space Advisory Board consultation submission, Alec actively participates in forging the future for commercial space technology in Canada.

INSPIRING FUTURE MARSONAUTS WITH 3D GAMES PROGRAMMING



MONTREAL SPACE SYMPOSIUM
OCTOBER 2017

OTHERS

AUTRES

Policy makers in education now emphasize the importance of science, technology, engineering, and math (STEM). This change has opened up a lot of opportunities to develop curriculum on the thrilling science of Mars exploration. In this presentation I explain how my experiences teaching 3D games programming to high school students can and should be adapted to learn science through a virtual Martian environment.

This talk presents "Martian Agora", a 3D Mars game I developed to help with science instruction. The game uses real Mars terrain data and engineering concepts from Mars Society publications. Students learn science concepts while exploring how this game is built. Concepts like: gases, pressures, humidity, composition, radiation, coordinate systems, energy storage, energy production, gravity, and much more. For more information and videos, please visit my website.

*DAY/JOUR 2
ROOM/SALLE A
17:00 - 17:30*

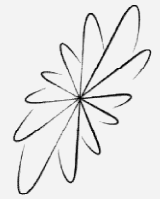
STUART SPENCE

*GRADUATE STUDENT/WORKSHOP LEADER AT
CONCORDIA UNIVERSITY/MCGILL UNIVERSITY*



Stuart is a programmer and educator. He studied computer science at McGill and education technology at Concordia. He has worked in the software industry and as a high school technology teacher. His YouTube videos have nearly a million views, where he teaches 3D games programming to people with little programming experience. Stuart is interested in education software, education games, free software, and technological literacy.

PUBLIC OUTREACH AND CEGEP PARTNERSHIPS



MONTREAL SPACE SYMPOSIUM
OCTOBER 2017

***OTHERS
AUTRES***

RASC-Montreal Centre holds member and public events throughout the year, mostly at their Observatory in Morgan Arboretum, but also at affiliate locations throughout the Greater Montreal area. Their Outreach events encourage public interest and knowledge in Astronomy. Over the last two decades, RASC-Montreal Centre has developed partnerships with two local Cegeps, John Abbott College and Vanier College. We will discuss some of the collaborative initiatives and public outreach events that have also enhanced the co-curricular opportunities available to students at both colleges, most recently evidenced by the fantastic Solar Eclipse Viewing events held at both campus on Aug 21st.

***DAY/JOUR 2
ROOM/SALLE A
17:30 - 18:00***

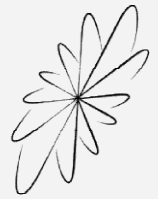
ABOUT THE RASC

Founded in 1918, the Montreal Centre is part of a Canada-wide network of 29 Centres affiliated under the banner of the Royal Astronomical Society of Canada.

Our members are hobbyists from all walks of life. Some members look at the sky through telescopes, others through binoculars, or with the unaided eye. Still others are armchair astronomers who don't observe at all. What they do have in common, though, is an interest in astronomy.

THE SPACE ELEVATOR

***OTHERS
AUTRES***



MONTREAL SPACE SYMPOSIUM
OCTOBER 2017

Since the first man-made satellite, Sputnik 1, was launched in 1957, mankind's presence in space has grown. However, our capacity to utilize space is very limited due to our singular method of space travel: rockets. Some decades from now a more sustainable and elegant transit system to space, known as a Space Elevator, may be established. The scope of such a project is immense and requires a tremendous amount of research and planning. This talk will describe the space elevator, explore some of its challenges, and focus on research that is currently underway.

***DAY/JOUR 2
ROOM/SALLE B
17:00 - 18:00***

STEPHEN COHEN

PHYSICS INSTRUCTOR AT VANIER COLLEGE



Stephen Cohen earned his Bachelor's (2004) and Master's (2006) Degrees in Mechanical Engineering at McGill University. His thesis describes the dynamics of a space elevator, and he has published several scientific papers on the topic. He worked at MDA Space as a Structural Engineer, where he helped to design space antenna payloads to survive the rigours of space launch and the orbital environment. His enthusiasm for science and teaching as well as his passion for writing and public speaking led him to modify the direction of his career. In 2010, he began working as a Physics Teacher at Vanier College.