2008 National Space Awareness Workshop

Montreal, Quebec
23 November, 2008

Presented by

Canadian Alumni of the International Space University

Organized jointly with

23 November 2008
McGill University
Montreal, Quebec

The **National Space Awareness Workshop** (NSAW) is a biannual event organized by the Canadian Alumni of the International Space University (CAISU). The workshop aims at promoting space awareness among students, young professionals and the community in general by having the participants working on topics in a space-related theme, through a very dynamic and interdisciplinary setting. This year's theme is "**Canadians in Space**".

Canadians in Space

During the workshop, you will have the opportunity to propose your own vision of the Canadian Astronaut Program. You will first receive lectures by worldwide experts, researchers, and professors in the space industry. Then, you will have the opportunity to form breakout working groups to address the conference theme. After the workshop, results from the breakout groups will be collated into a final report and distributed to interested parties, Canadian universities, Canadian space companies and stakeholders of the Canadian space industry.

Sponsored by

CANADIAN FOUNDATION FOR THE
International Space University

MESSAGE FROM THE WORKSHOP CHAIRMAN

Dear National Space Awareness Workshop Participant,

During the National Space Awareness Workshop, you will be asked to propose your own vision of the Canadian Astronaut Program. In the morning lectures, you will hear from several experts in the field from many different backgrounds that will present you their vision of **Canadians in space**. During the afternoon breakout session, you will have the opportunity to work in small breakout groups in order to come up with your own creative strategies and vision to reshape the Canadian Astronaut Program, from an interdisciplinary perceptive, with the help of several representatives from the Canadian space industry. This vision should include policy and laws aspects, business and economics objectives, engineering and medical science challenges, public awareness and space education. During the afternoon breakout session, breakout group moderators will be available to answer your questions. Also, in order to allow your group to be as efficient as possible while working on the workshop topic, please bring your laptop if you have one.

To get you started, we suggest a list of questions you should start answering right away. Answers to these questions could help you to prepare a solid and creative perspective. We strongly encourage you to document yourselves before the workshop on each of these topics and to prepare answers to the best of your ability. Those answers could be used as building blocks to prepare your own vision of Canadians in space. These questions are:

- Which actions can be taken by the Canadian Astronaut Corp to increase public awareness and interest among Canadians?
- Is a private funded Canadian astronaut program preferable than a government funded program?
- Would it be realistic for Canada to sustain its own astronaut program, independently of the United States? If so, which infrastructure, knowledge and capabilities would need to be developed?
- Besides space awareness, what are there benefits of having an astronaut program for Canadians?
- Are the risks involved in any astronaut programs greater than the benefits?
- How should crew recruitment and training be conducted?
- Should Canada focus only on robotic space exploration?
- Is an astronaut program too costly for Canadians?

The results of this workshop will be compiled in a report with your name on it which will be distributed throughout the Canadian space community. Do not miss this opportunity to be heard!

Finally, please do not hesitate to ask us any questions you may have. We are looking forward to working with you on making this an enlightening and constructive workshop experience for everyone.

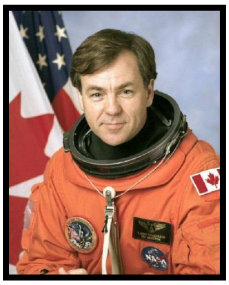
Yours sincerely,

Steve Ulrich
Vice-President, Canadian Alumni of the International Space University (CAISU)
Chair, National Space Awareness Workshop (NSAW)
Email: steve.ulrich@ngcaerospace.com

WORKSHOP SCHEDULE

Sunday, 23 November 2008	
08h30 – 08h45	**Registration** Leacock Building
08h45 – 09h00	**Welcome and Introduction**
09h00 – 09h30	**Mr. Viqar Abbasi,** Technical Manager, Canadian Space Agency *From Saint-Hubert to Space: The Untold Story of Canada's Role in Human Space Flight*
09h30 – 10h00	**Dr. M. Lucy Stojak,** President, Consultants M.L. Stojak Inc *Governing Human Activities in Space: Legal and Policy Issues*
10h00 – 10h30	**Coffee Break**
10h30 – 11h00	**Mr. Yves Sévigny**, Coordinator, Cosmodome Space Science Centre *Cosmodome's Space Camp as a Way to Educate the Next Generation of Space Explorers*
11h00 – 11h45	**KEYNOTE SPEAKER** **Bjarni Tryggvason**, Former Astronaut, Canadian Space Agency Visiting Professor, University of Western Ontario
11h45 – 12h15	**Mr. Matthew Bamsey,** PhD Candidate, University of Guelph *Canadian Biological Life Support Capabilities and Analogue Research*
12h15 – 13h00	**Lunch**
13h00 – 15h30	**Breakout Session** Leacock Building Room 14, 15, and 109
15h30 – 16h30	**Presentation from Breakout Groups** Leacock Building Room 26
16h30 – 17h00	**Dr. Robert D. Richards,** Director of Space Technology, Optech Inc. Co-Founder, International Space University *Visions of the Space Generation - Young People Creating the Future*
17h00 – 17h15	**Wrap-Up**

KEYNOTE SPEAKER BIO



Bjarni Tryggvason obtained a B.Ap.Sc. Degree in Engineering Physics from the University of British Columbia, and did post graduate work in applied mathematics at the University of Western Ontario. He has three honorary degrees: a Dr. of Sci. from the University of Western Ontario (1998), a PhD from the University of Iceland (2000) and a Dr. of Eng. from the University of Victoria (2005). He flew as a Payload Specialist on the US space shuttle in August 1997, spending 12 days in space working on the Microgravity Vibration Isolation Mount (MIM) and several experiments in fluid science. He was the principal investigator for the MIM-1 that flew on the Russian Mir space station (1996-1998), for the MIM-2 on his flight on the space shuttle and initiated the development of the Microgravity Vibration Isolation Subsystem (MVIS) incorporated into the European Space Agency (ESA) Fluid Science Laboratory (FSL), currently on board the International Space Station (ISS) in the ESA Columbus laboratory module. He completed mission specialist training at the Johnson Space Center in Houston for both the space shuttle and the ISS from 1998 to 2000. He was awarded the NASA space flight medal (1997), and the Order of the Falcon from Iceland.

He retired from the Canadian Space Agency in 2008 and is currently a Visiting Professor at the University of Western Ontario in the Department of Mechanical and Materials Engineering. His current research is in three main areas: vibration isolation technology for the ISS, the effect of spacecraft vibrations of behavior of fluids in the free-fall environment, and on the spin characteristics of airplanes. He supervises several graduate student and fourth year projects. He has been a lecturer at several universities in dynamics, aerodynamics and applied mathematics. He currently lectures a senior course in Flight Dynamics and another in space system design. He has authored or co-authored more than 40 research papers, and holds several patents.

He is the President of QDAC Inc, a company specializing in high resolution electronic systems.

He is an active Airline Transport rated pilot with 5000 hours of flight time, has flown numerous types of aircraft including the Tutor jet with the RCAF and the NASA T-38. He is the Chief Operations Officer with the Canadian Harvard Aircraft Association (CHAA) which operates out of Tillsonburg, Ontario, and flies with CHAA as a formation display and aerobatic pilot

SPEAKERS BIO

Mr. Viqar Abbasi works at the Canadian Space Agency (CSA), as a supervisor within the MSS Training group of Operations Engineering branch, responsible for ongoing operations and maintenance of the Mobile Servicing System (MSS), Canada's contribution of advanced robotics to the International Space Station (ISS). The MSS Training group provides training and certification of international astronauts, cosmonauts and mission controllers to operate the Canadian robotics on ISS, commonly known as Canadarm2 – the heavy-lifting arm that can "walk" to different bases on the ISS - and Dextre – the two-armed dexterous robot for ISS maintenance and servicing. In his role as Technical Manager, Viqar provides leadership and expertise in the planning and requirements definition for all training tools and facilities, including the MSS Operations and Training Simulator (MOTS), currently the world's top simulation facility for Dextre. Prior to joining CSA in 2002, he worked for six years at CAE, Canada's leading flight simulator company, where he was a key member of the team who designed and developed the robotics simulator for CSA. Viqar holds a Master's of Aerospace Engineering from Ecole Polytechnique de Montréal, and a Bachelor of Science from York University's unique "Space and Communication Sciences", a specialized honours program combining Computer Science and Physics. In both of these programs, he worked on a large variety of space projects, ranging from remote sensing to Mars sample return to medical robotics. In 2005, Viqar earned his Project Management Professional (PMP) designation from the Project Management Institute (PMI). In 2007, he completed the International Space University's Summer Session Program (SSP), held in Beijing, China.

Dr. M. Lucy Stojak hold an undergraduate degree in law from the Université de Montréal, and a Masters (LL.M) and Doctorate (DCL) degree in law from the Institute of Air and Space Law, McGill University. She is a Faculty Member of the International Space University (ISU) and a regular invited lecturer at the Institut du droit de l'espace et des télécommunications, Université de Paris Sud-IX, HEC Montréal -ESCP Executive MBA, and the Institute of Air and Space Law, McGill University. Since 2001, her Montreal-based consulting firm carries out studies for the Canadian Space Agency (CSA) and Foreign Affairs Canada. She has represented the Canadian government at numerous international intergovernmental organizations such as the OECD and ESA. She was a Senior Researcher at the Centre for Research in Air and Space Law, McGill University and was part of the Canadian delegation to the Conference on Disarmament ad hoc Committee on the Prevention of an Arms Race in Outer Space (PAROS) for several years. She served as the first Director of the ISU Summer Session Program (SSP) from 1994-2000 and also served as co-chair of the Policy and Law Department. Dr. Stojak was part of the Working Group dealing with Data Policy Issues in the Global Monitoring for the Environment and Security (GMES) project, and is part of the Canadian team involved with the Global Earth Observation System of Systems (GEOSS) project. She is currently involved in the Space Security Index, a research partnership between several governmental, non-governmental and academic institutions. In collaboration with the Ottawa based Rideau Institute, she helped organize the 2008 Canadian Roundtable on Space. She served as the elected Chair of the ISU Academic Council from 2004-2006. She is a member of the Board of Trustees of the Canadian Foundation for ISU (CFISU), the Board of Advisors of the Space Security Index, the European Centre for Space Law, the International Institute of Space Law (IISL), the International Astronomical Academy (IAA), and the Board of Editors of *Space Policy*.

Mr. Yves Sévigny. I have always been interested in science. As child, I was dreaming of being a chemist (or an archaeologist!) and I ended up as President of my high school Science club (as well as the school student journal and playing clarinet for the school big band and sitting at the student council…). I though I had the profile for science studies. The shock came in my first year of college. I don't have a mathematical mind. I am not good with maths… and that blew out my bubble. I was out for science. So I took another way. If I was not strong enough for science studies I will study those who study science! I chose history of science with a strong influence from sociology of science. While writing my master thesis in history, I started another master degree in museology (another childhood passion) specialize in science museums and exhibits.

After working a few years as research assistants in most the Montreal universities, I ended up in 2000 at the Cosmodome de Laval doing a job combining everything together: history, science and museology. From 2002 to 2008, I have been in charge of the Space science centre at the Cosmodome de Laval. I had to care for the different artefacts in the exhibit and to review/create new educational program for our school clientele. Since 2008, I have move up to assistant-head of service Operations where I have to manage the Operation's coordinator team, review all educational program and design new management process for the operation services.

Mr. Matthew Bamsey holds a B.Eng. in Aerospace Engineering from Carleton University in Ottawa and a M.Sc. in Aerospace Engineering from the University of Colorado at Boulder, concentrating primarily on life support and space suit design. Matt is currently pursuing a Ph.D. with the University of Guelph, focusing on advanced life support under a Natural Sciences and Engineering Research Council of Canada scholarship while stationed at the Canadian Space Agency and the Controlled Environment Systems Research Facility. He has spent several years as a student at the Canadian Space Agency, where he has worked with the RADARSAT-2 program and with the Space Science department on the Arthur Clarke Mars Greenhouse project on Devon Island in the Canadian High Arctic. In 2007 Matt was selected from a worldwide call of applicants and participated in a four month scientific expedition to the Flashline Mars Arctic Research Station in the Canadian High Arctic. Matt has been active in various space advocacy groups for many years and was president of Mars Society Canada between 2003 and 2005. He is also the current student advisor to the Mars Institute Board of Advisors and a member of the Canadian Advanced Life Support Discipline Working Group.

Dr. Robert (Bob) Richards is the Founder and CEO of Odyssey Moon Limited, a commercial lunar enterprise based in the Isle of Man and the first official registrant in the $30M Google Lunar X PRIZE competition. He is also the Director of Space Technology at Optech Incorporated of Canada, where he presided over the first commercial lidar scanner flown in space as well as the first meteorological lidar flown to another planet aboard the NASA Phoenix Mars Lander.

Bob studied aerospace and industrial engineering at Ryerson University; physics and astronomy at the University of Toronto; and space science at Cornell University where he became special assistant to Carl Sagan. In 1987 Bob founded the International Space University (ISU) with Peter Diamandis and Todd Hawley, where he served as the university's first Associate Administrator for Strategic Planning and chaired the board's administrative and strategic planning committees during ISU's first phase of development. Today Bob continues to serve on the Board of Trustees of ISU; now a well established global institution operating out of its Central Campus in Strasbourg, France, with thousands of graduates worldwide. Bob first joined forces with Diamandis and Hawley in the creation of Students for the Exploration and Development of Space (SEDS), which continues today as the largest student run space organization in the world, and the Space Generation Foundation, whose youth outreach programs today include Yuri's Night and the Space Generation Congress, with UN Observer Status and space policy activities through its sister organization, the Space Generation Advisory Council. .

Bob is a strong advocate of the NewSpace movement and has been a catalyst for a number of astropreneurial ventures throughout his career. He serves on the boards of numerous international space organizations and in 2005 was elected Vice President of the International Lunar Exploration Working Group (ILEWG) as well as a Member of the International Institute of Space Law of the International Astronautical Federation.

Bob is the recipient of four international space awards: the K.E. Tsiolkovski Medal (Russia, 1995), the Space Frontier “Vision to Reality” Award (USA , 1994), the Arthur C. Clarke Commendation (Sri Lanka, 1990) and Aviation & Space Technology Laurel (USA, 1988). He is a contributing author of "Blueprint for Space", published by the Smithsonian Institution (1992), and "Return to the Moon", published by Apogee Books (2005).

In 2005 Bob received a Doctorate of Space Achievement (honoris causa) from the International Space University for “distinguished accomplishments in support of humanity’s exploration and use of space.”

BREAKOUT GROUP MODERATORS

During the afternoon workshop sessions, breakout group moderators will be available to answer your questions and to guide you through the process of proposing your own vision for **Canadians in Space**. They will be the experts helping out and advising the breakout groups.

Mr. Duncan Cree is from Oka (Kanesatake), Quebec, and is in the fifth year of a PhD program at Concordia University working on a new light weight material. Duncan has Bachelor and Masters degrees in Mechanical Engineering and has worked at Pratt & Whitney Canada and Bombardier (Defense Services) as a summer intern. He also worked two years at the National Research Council of Canada as an airworthiness engineer trainee for their Flight Research Laboratory. In summer 2007, Duncan won a scholarship to attend a nine week Summer Session granted by the Canadian Foundation for the International Space University in Beijing. He has also attended high school science fairs to act as a judge and role model on various native reserves in Quebec.

Mr. Jian-Feng Shi is a Navigation and Control Systems Engineer at MDA Space Missions. He is currently working on the Canadarm2 project for the International Space Station (ISS). Jian-Feng has seven years of professional experience in the Aerospace Industry; he has worked on variety of projects including maintenance software for CF-18 fighter aircrafts, Flight Dynamics Software (FDS) for geostationary satellites, and Plant Research Unit (PRU) for the ISS. Jian-Feng holds a Bachelor of Engineering (B.Eng.) degree in Aerospace Engineering from Carleton University and a Master of Applied Science (MA.Sc.) degree from University of Toronto Institute for Aerospace Studies (UTIAS). Jian-Feng is a certified Project Management Professional (PMP) and a licensed Professional Engineer of Ontario (P.Eng.). Jian-Feng is a the regional director for the Canadian Alumni for the International Space University (CAISU), and serves on the Executive Committee for the Professional Engineers of Ontario (PEO) Kingsway Chapter.

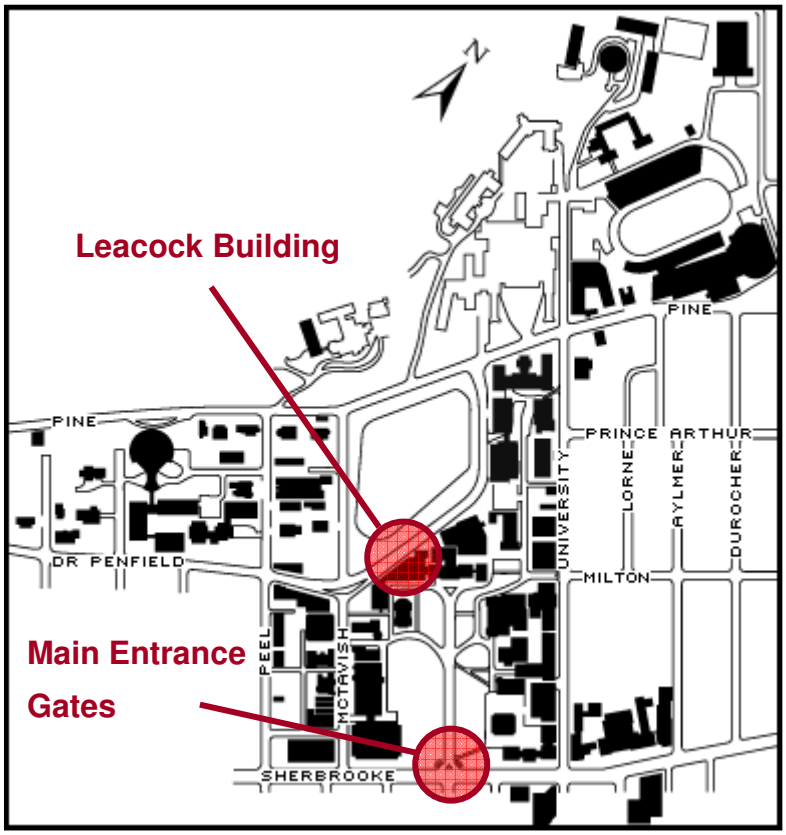
Dr. Jean-François Hamel is a Guidance, Navigation and Control Engineer at NGC Aerospace Ltd. He is involved in several projects regarding autonomous planetary landing systems, Earth observation mission design and analysis and formation flying guidance, navigation and control. Jean-François holds a Ph.D. and a M.A.Sc in Electrical Engineering from Université de Sherbrooke, a B.Sc. in Mechanical Engineering from Université de Sherbrooke and is a International Space University Space Studies Program graduate. He is the author of nearly 20 international journal and conference publications in the field of spacecraft formation flying guidance and control, autonomous planetary exploration navigation systems and aerocapture technologies.

REGISTRATION

The registration to the NSAW is **free**. However pre-registration for the NSAW is a must, since a maximum number of attendees is set at 100 people, on a first come, first served basis. To pre-register, please contact Mr. Steve Ulrich, NSAW Chair, at steve.ulrich@ngcaerospace.com

The free registration to the NSAW also **includes a coffee** in the morning **and a lunch** (cold buffet).

HOW TO GET THERE



McGill University
Downtown Campus
Leacock Building, room 26
855 Sherbrooke Street West
Montreal, Quebec
H3A 2T7

McGill's downtown campus is located in the heart of cosmopolitan Montreal in the province of Quebec, Canada.

Web-map tools [such as Google Maps or Yahoo Maps] will help you plan your drive to McGill University. Using "855 Sherbrooke Street West, Montreal" as the destination address will lead you directly to the Leacock Building.

By subway: Montreal has a wonderful subway system, called the "Metro". To reach McGill University's downtown campus, take the "**Green Line**" to the "McGill" station. Metro maps, fares, and further information can be found on the STM website http://www.stm.info/

By bus: The terminal for major bus lines is the Station Centrale d'Autobus Montréal, located at 505 de Maisonneuve est, corner of Berri. From Station Centrale you can take a taxi to the University (approximately 10-12$ CDN, plus tip) or take the Metro (subway), as the "Berri-UQAM" station is connected to the bus terminal; McGill University is at the "McGill" metro station.

Important note: While there is limited paid visitor parking on campus, there are parking meters along Sherbrooke Street and University Street, as well as commercial parking lots close by. You may prefer to leave the car at your hotel and walk over!

Created in 1987, the International Space University (ISU) is an **interdisciplinary**, **intercultural**, and **international** academic institution preparing individuals to respond to the current needs and the increasing and evolving demands of the space sector in a rapidly changing world. Excellence in space education for a changing world and the international network of friends and contacts are a unique result of three primary academic ISU programs: the Master of Science in Space Studies (MSS) and the Master of Science in Space Management (MSM), the Summer Session Program (SSP). The permanent campus is located in Strasbourg, France.

Supporters of ISU include many of the world's space industrialists, in addition to space agencies from the four corners of the globe: Russia (RKP), USA (NASA), Japan (NASDA), Canada (CSA), Europe (ESA), India (ISRO), and China, among others. As a result, Alumni have come from each continent but also from each imaginable career path; Law, Architecture, Engineering, Science, Business, Management, Medicine, Psychology, Education, and the list goes on.

The Canadian Alumni of the International Space University (CAISU) is the Canadian alumni organization of the International Space University. It is a private, non-profit association whose main objectives are:

- Provide for the promotion and preservation of contacts between all Canadian alumni of the International Space University (ISU).
- Inform any interested party in Canada about the affairs of ISU.
- Cooperate with other interested organizations in Canada in promoting the cause of peaceful space activities.
- Represent the members when dealing with the various institutions of ISU and its representatives.
- Advance space education and space research in Canada.

Our members are active in promoting ISU and its programs. CAISU is also organizing programs of university space-education in Canada. Founded in 1989, the CAISU has more than 300 members across Canada and around the world. A Board of Directors who are CAISU members elected by the members runs the CAISU.