

ASC ENS ION 2020



About SEDS-Canada

We are Canada's only student-run non-profit that works at the national level to inspire and empower students joining the space industry, and to advocate for the advancement of space exploration in the public sphere.

Student Empowerment

Along with our annual conference, design challenges, and competitions in entrepreneurship, SEDS-Canada helps students develop a professional network to join that directly strengthens the Canadian space industry.

Advocacy

Through our growing network of student members and our advocacy efforts, we are building a collective student voice capable of advocating for the benefits of space exploration to the public at large, media, and government.

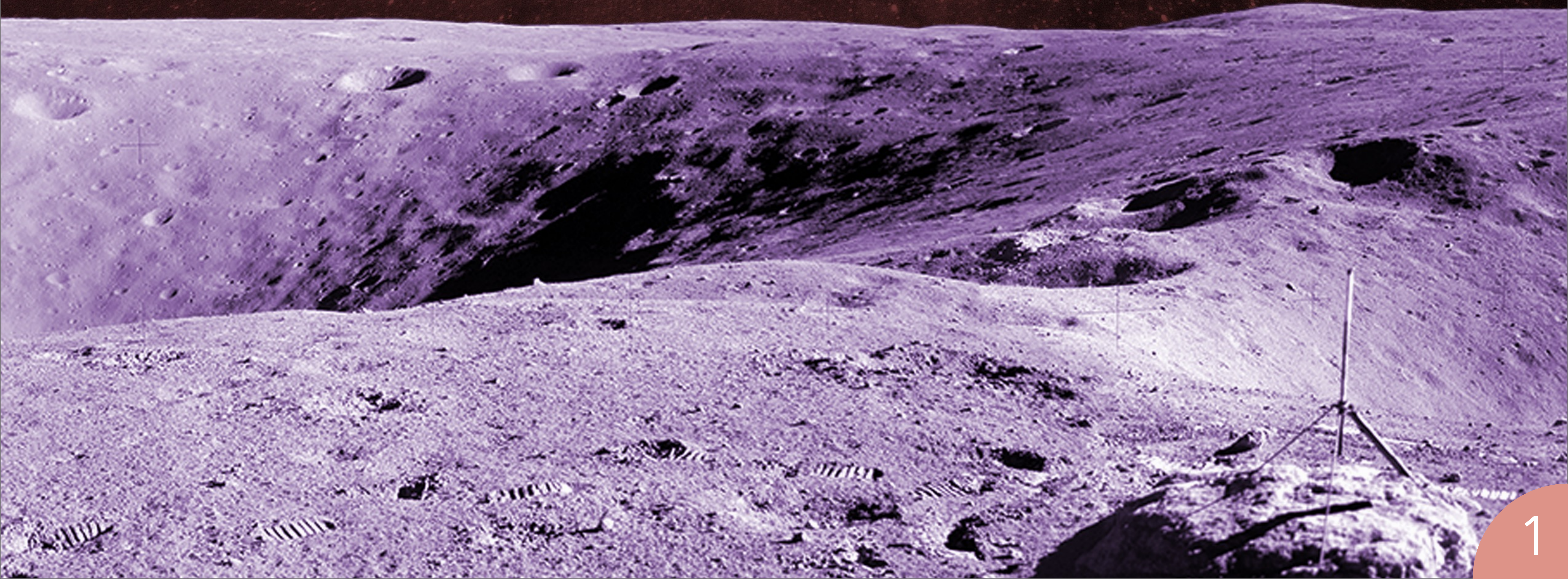


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ASCENSION 2020

Message from the organizing team

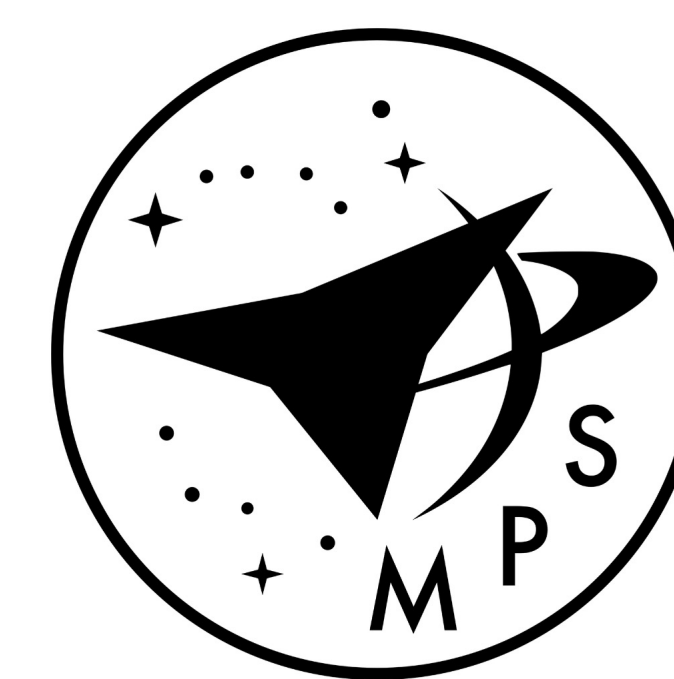
Greetings!

It is our pleasure to invite all of you great students, young professionals, researchers, industry representatives, and experts from all over Canada to attend SEDS-Canada's annual conference Ascension from February 28 to March 1, 2020 in Hamilton, Ontario. This weekend features an impressive list of 34 outstanding speakers and panelists over 5 sessions and 5 panels!

Ascension is a conference organized by students, for students. It brings together representatives from all parts of Canada's space sector with students who will undoubtedly mold Canada's future presence in space. Over the course of these three fun- and information-filled days, you should expect to meet new people, learn new things, and feel inspired to continue your own path to space.

We welcome you to Hamilton and hope your conference experience is interesting and productive.

Ad astra,
Ascension 2020 Organizing Team



McMaster
Planetary
Society



Meet the team

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2020

Ascension 2020 is brought to you by a dedicated team of students led by three amazing people:



HIRA NADEEM, President, SEDS-Canada

Hira Nadeem is a final year Electrical Engineering student at McMaster University. She is the President of the Student's for the Exploration and Development of Space (SEDS) Canada, a student run, not-for-profit organization focused on providing post secondary students with research and professional development opportunities within the Canadian space sector. She is also the Operations and Co-Project Manager for the McMaster NEUDOSE cube satellite mission a part of the Canadian CubeSat Project with the Canadian Space Agency. Hira co-founded the McMaster Planetary Society (MPS) in 2016, a student club created to connect students interested in space and exploration at McMaster. Most recently, she has been selected as a Brooke Owens Fellow for the Class of 2020 and will be working at Planet this summer in San Francisco, California. She would like to lead exploratory space missions someday and use her background to improve the climate and quality of life on Earth.



BRYAN SOUTHWELL, Events Chair, SEDS-Canada

Bryan has a B.Eng. in Aerospace Engineering, Space Systems Design from Carleton University and is pursuing a collaborative MASc in Electrical and Robotic/Control engineering with the Institute for Earth and Space Exploration at Western University. His thesis research is focused on increasing the lifespan and efficiency of rover missions through onboard and real-time planetary surface analysis using an instrumented rover wheel and machine learning techniques. Bryan interned at NASA-JPL in May-September of 2019, where he worked in the Machine Learning and Instrument Autonomy group on the instrumented rover wheel project. While not working on his thesis, Bryan is a member of the systems engineering team for the Western CubeSat project, funded by CSA's Canadian CubeSat Project.



SOBIA NADEEM, President, McMaster Planetary Society

Sobia Nadeem is a second year Engineering Physics student at McMaster University. She is the President of the McMaster Planetary Society and in November of 2019, her team organized McMaster's first Space Week. There were several events hosted by other McMaster space teams and clubs during the week, with the McMaster Planetary Society's Space Industry Night being a highlight. Sobia is passionate about space outreach as well as art. She was a former youth poet for the Hamilton Youth Poets, as well as a former artist for McMaster Unspoken, a poetry initiative on campus. She is excited to co-host the Ascension Space Conference at McMaster University this year!

Getting around

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2020

All activities at Ascension 2020 will be hosted in the **McMaster Innovation Park (MIP)**. MIP is located on Longwood Road South between Aberdeen Ave. and Main St. W., in western Hamilton. It is along Highway 403 which provides easy access to MIP from the Niagara Peninsula through to the GTA.

MIP's full address is 175 Longwood Rd S Suite 101A, Hamilton, ON L8P 0A1.

Transit

HSR (Hamilton Street Railway)

Hamilton's municipal transit system has a bus stop directly in front of the Atrium @ MIP.

GO Transit

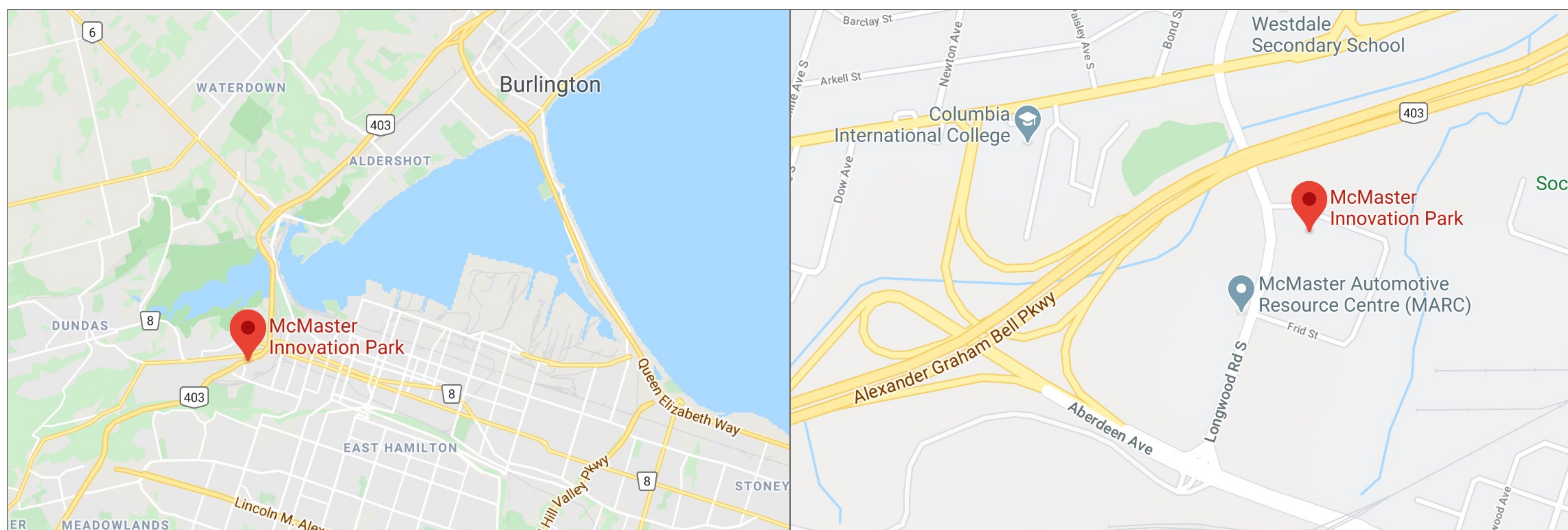
The Hamilton GO Centre consists of a train and bus station and is located at 36 Hunter St. E. There is also a GO bus terminal on the McMaster University campus. The HSR goes from both locations to MIP.

By Car

From Toronto, Oakville, and Burlington

Take Highway 403 to Highway 8 West Main St. Exit. At the traffic lights at the top of the ramp turn right. Proceed on Main St. West and then turn right onto Longwood Road South and park at the Visitor Parking area.

Visitor parking payment is required from 8:00 a.m. to 5:00 p.m. Monday to Friday. Exact change, Mastercard or Visa, are the payment options. **There is free parking on Friday after 5 p.m. and on the weekend.** Electric car charging stations are available.



- 1) Head to the check-in desk in the main atrium of McMaster Innovation Park. There will be signs directing you to its location.
- 2) Check-in and pick up your badge!

If you have a question during the conference, need help with something, or anything, really, just look out for an organizer badge.



Example attendee badge (left) and organizer badge (right).

- 3) Pick up some swag from the swag table!
- 4) Start tweeting & sharing! The conference hashtag is #ASCENSION2020. Tag @sedscanada on Instagram or Twitter!

There may be prizes for social media engagement ;)


- 5) Check out the charities listed on page 18 of this booklet. We're continuing an Ascension tradition that was started last year: in lieu of speaker gifts we're donating to a charity of our attendees choice. We'll be hosting a live vote at some point during the conference, so make sure you know which charity you're rooting for!
- 6) **Ask questions, meet people, and have fun!**

FRIDAY

6:30 p.m.	Doors open & registration
7:00 p.m.	Opening remarks: Hira Nadeem (SEDS-Canada)
7:10 p.m.	STEAM Fair Welcome: Jay Modi (Starscape Creative)
7:20 p.m.	<i>Poetry</i> Ethan Kleinikkink, Hira Nadeem, Sobia Nadeem
7:35 p.m.	Keynote Speakers: Dr. Parshati Patel (Western U) & Bhairavi Shankar (Indus Space)
8:35 p.m.	<i>Performance by MAC Dance</i>
8:50-10:00 p.m.	<i>STEAM Fair (see page 10)</i>

SATURDAY

8:00 a.m.	Registration & Light breakfast
9:00 a.m.	Keynote Speaker: Christine Tovee
10:00 a.m.	<i>PANEL 1: Space Startups</i> Moderator: Dr. Gay Yuyitung (MILO) Panelists: Jean-Francois Gauthier (GHGSat), Adam Trumpour (Launch Canada), Sohrab Haghghat (SpaceRyde), Daniel McCammon (C6 Launch)
10:50 a.m.	Coffee break
11:05 a.m.	<i>Session #1: Entrepreneurship in Space</i>
	Julia Gibson (Sinclair Interplanetary)
	Adam Sniderman (Canadensys)
12:00 p.m.	<i>Lunch</i> Industry & Student Team Expo LinkedIn Photos

	<i>Session #2: Student Competitions</i>	
1:00 p.m.	Devan Wagner (McMaster NEUDOSE)	
	Michael Stramenga (MERGE)	
	Alex Sekung (University of North Texas Analogue Astronauts)	
2:00 p.m.	<i>Workshop: Build your company!</i> Tammy Hwang (City of Hamilton, CoMotion Group)	
3:30 p.m.	<i>Student Abstract Presentations (see page 19)</i>	
	<i>Room 1</i>	<i>Room 2</i>
	<i>Arielle Ainabe</i> McMaster University	<i>Kirtan Dhunnoo</i> University of Alberta
	<i>Alyssa Ang, Shawn Lobo, Jeff Kim, Molly Lu, Priya Jain (WatLock)</i> University of Waterloo	<i>Addy Bhatia</i> University of Toronto
	<i>Victoria Flood</i> University of Guelph	<i>Tamjeed Elahee</i> University of Ottawa
4:10 p.m.	Coffee break	
4:25 p.m.	<i>PANEL 2: Education & EDI (Equity, Diversity, and Inclusion)</i> Moderator: Dr. Parshati Patel (Western U) Panelists: Kate Howells (The Planetary Society), Bhairavi Shankar (Indus Space), Eric Choi (Magellan Aerospace)	
5:15 p.m.	<i>Session #3: Space Exploration</i>	
	Dr. Shawna Pandya (Project PoSSUM)	
	Parshati Patel (Western U)	
6:00 p.m.		GHGSat Networking Session
6:30 p.m.	Gala Dinner with Keynote Speaker: Dr. Mehran Anvari <i>Remote Surgery: The Journey from the Arctic to Mars</i>	

SUNDAY

8:30 a.m.	Light breakfast
9:00 a.m.	Keynote Speaker: Linda Dao (Canadian Space Agency)
10:00 a.m.	<p><i>PANEL 3: Space Law & Policy</i> Moderator: Aram Daniel Kerkonian (Ardaker Space Consultants)</p> <p>Panelists: Michael Pley, Charlie Nitschelm (SEDS USA), Andrew Simon-Butler, Dr. Shawna Pandya (Project PoSSUM)</p>
10:50 a.m.	Coffee break
11:05 a.m.	<i>Session #4: Going Back to the Moon</i>
	Elias Solorzano (MDA)
	Kaizad Raimalwala (Mission Control)
12:00 p.m.	<p><i>Lunch</i> Industry & Student Team Expo LinkedIn Photos</p>
1:00 p.m.	<p><i>PANEL 4: SGAC Panel: Space for a New Generation - Harnessing the Creative Economy</i> Moderator: Zaid Rana (SGAC)</p> <p>Panelists: Kaizad Raimalwala (Mission Control), Andrea Yip (Luna Design and Innovation), Michael Pley</p>
1:55 p.m.	 First Ontario Networking Session
2:25 p.m.	<i>Session #5: Advancing Technologies</i>
	Artash Nath
	Shira Jackson (University of Toronto)
3:15 p.m.	<p><i>PANEL 5: Off the Record</i> Moderator: Hira Nadeem (SEDS-Canada)</p> <p>Panelists: Andrei Hanu (McMaster University), Thomas Sears (Queen's U), Dr. Marianne Mader (CASC)</p>
4:05 p.m.	Keynote Speaker: Allyson Brady (McMaster University)
5:05 p.m.	Closing remarks: Hira Nadeem (SEDS-Canada)

SEDS-Canada and STARSCAPE Creative have partnered up for the first night of Ascension 2020 programming with a STEAM (Science, Technology, Engineering, Art, and Math) Fair. As part of the STEAM Fair, Dr. Parshati Patel and Bhairavi Shankar will be giving a keynote talk, and there will be live performances (poetry & dance). Please stay seated for performances. The STEAM Fair will be open after they conclude.

The art fair will present artworks of all types submitted to us by the public, as well as winning artworks from two SciArt Exchange International Competitions. The art fair will be open during the performances.

PUBLIC SUBMISSIONS

<i>Artists</i>	<i>Theme</i>	<i>Medium</i>
Hira Nadeem	Earth X Space	Painting
Paula Bosca	Astronomy	Painting
Diana Dumitrescu	Astronomy	Photography
David Elliot Mattiacci	Human Space Flight	Digital
Katrina Elena	Earth X Space	Oil Painting
Avali Anne Marika Stoltz	Lunar Exploration	
Alyssa Langella	Lunar Exploration	Painting
Orion Dias	Lunar Exploration	Sketch
Nevita Sankar	Discovery & Change	Painting
Cian O'Regan	Human Space Flight	Photography
Parshati Patel	Astronomy	Photography
Ethan Kleinikkink	Lunar Exploration	Literature

SCIART EXHACNGE INTERNATIONAL COMPETITION WINNERS



Humans in Space Youth Art Competition

2019 Competition, Visual Art Winner	Moon Shining
2019 Competition, Literature Winner	The Moon Speaks
2010 Competition, Visual Art Winner	Mission to Europa



For more about the contest and winners, see www.HumansInSpaceArt.org and www.sciartex.net/moon-youth-art-competition-gallery.html

Project Mars Competition

Film Winner	Rendezvous with Mars
Film Winner	Morning Blue
Film Winner	Nomadic Cloud
Poster Winner	Mars is in Our DNA



For more winners, see www.ProjectMarsCompetition.org



DR. PARSHATI PATEL

Keynote Friday @ 7:35 p.m., Space Exploration Saturday @ 5:40 p.m.

Dr. Parshati Patel is an astrophysicist, science communicator and educator based in London, Ontario. She is an Educational Outreach and Communications Specialist at the Institute for Earth and Space Exploration and an Adjunct Research Professor in the Faculty of Education at Western University. She is currently pursuing a professional certification in Public Relations and Communications from Western University. She has been communicating her passion for space science and technology with students and public for the past 8 years in various capacities through outreach initiatives and programs at Western University. Dr. Patel conducts research in the Faculty of Education understand and gauge the engagement of the participants as well as their outlook on STEM (Science, Technology, Engineering and Mathematics) careers and interest in STEM fields. She has co-founded Women of Color in STEAMM (Science, Technology, Engineering, Arts, Mathematics and Medicine) in Canada in 2018. Since June 2019, Dr. Patel is part of the Principal Scientific Adviser's Consultive Group to Government of India.



BHAIRAVI SHANKAR

Keynote Friday @ 7:35 p.m.

Bhairavi is a Planetary Scientist and founder/CEO of Indus Space. Through her company, she actively focuses on public education in space science working with school aged students. She also helps to connect the public with space themed resources, assisting with curriculum development. She loves to promote space science and the role of women in science as often as possible.



CHRISTINE TOVEE

Keynote Saturday @ 9:00 a.m.

Christine completed a BAsC in Engineering Science-Aerospace from the University of Toronto and Masters in Aeronautics and Astronautics from MIT. Christine has notably worked with BAE, EADS Astrium Services, and was appointed Vice President for Research and Technology and Chief Technology Officer for the US arm of Airbus Group, Inc. At Airbus, Christine helped determine the technology needs of all business lines in the US and for delivered US-based research for the entire company. Christine now focuses on organizational topics related to innovation and engineering. Through her company, CATx Technology, she also as a consultant to Toronto area technology start-ups on technology road mapping, strategy and organizational design. Christine is a member of Canada's Space Advisory Board, which provides advice on Canada's space strategy to the Minister for Industry, Science and Economic Development. She also sits on the Department of National Defence (DND) Independent Review Panel for Defence Acquisition and is a mentor for the Space stream at the University of Toronto's Rotman Business School Creative Destruction Lab.



JULIA GIBSON

Entrepreneurship in Space Saturday @ 11:05 a.m.

Julia Gibson is an American applied mathematician, poet, musician, and visual artist currently working for Sinclair Interplanetary, a small Toronto-based space company. After studies in violin performance at Manhattan School of Music, she finished her undergraduate degree in cognitive science at Brown University and a master's in mathematics at McMaster University. Her first book of poetry was released in 2019. Her interests in the space industry include robotics, navigation, propulsion, and the politics of space exploration and commercial services.



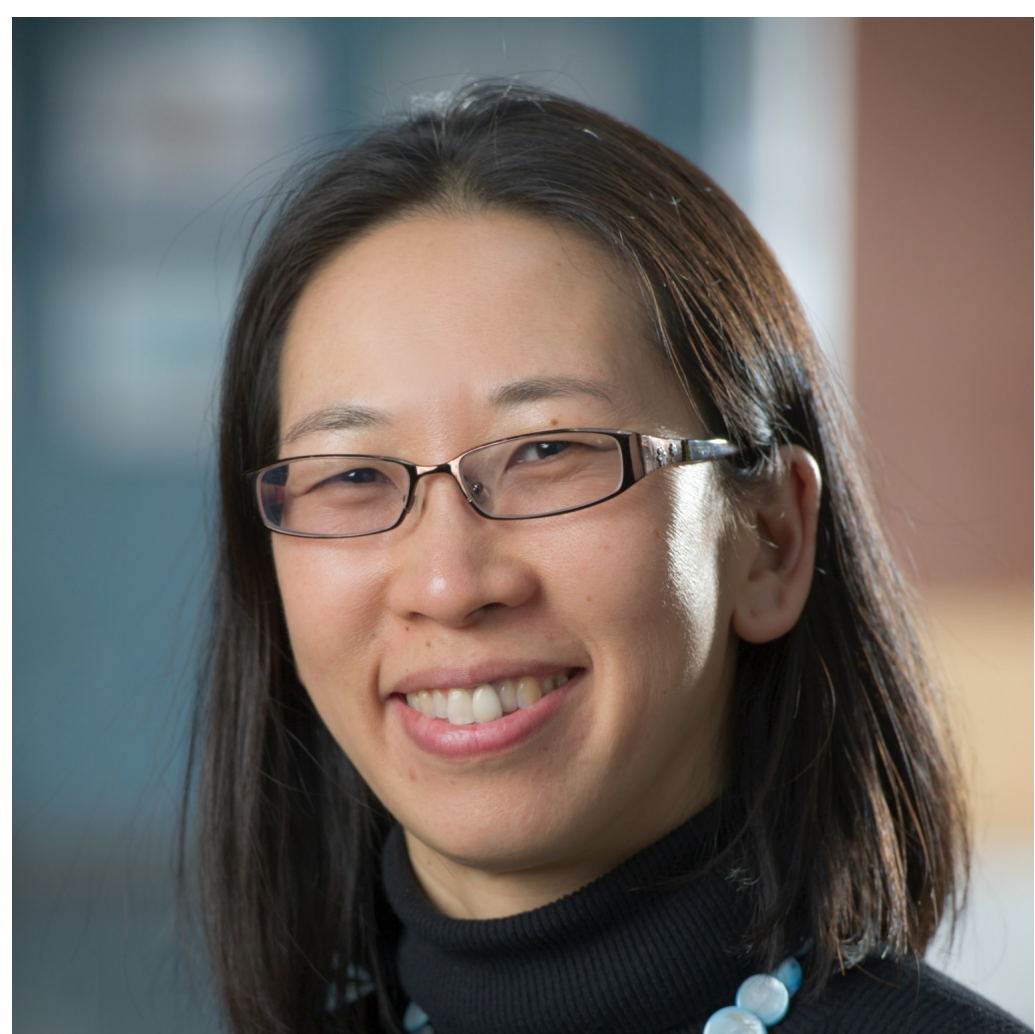
ADAM SNIDERMAN

Entrepreneurship in Space Saturday @ 11:30 a.m.

Dr. Adam Sniderman is a systems engineer working at Canadensys Aerospace, where he develops devices and software for robotic systems both on- and off-planet. He holds a Ph.D. in aerospace engineering from the University of Toronto and a B.A.Sc. in mathematics & engineering from Queen's University, with a specialization in control theory and robotics. Adam has long had his head in the clouds, but is a recent transplant into the space sector, coming from a background spanning medical robotics, machine learning, and coordinated multirobot systems. He is passionate about science communication and education, and is excited to be joining this year's SEDS Ascension line-up.

PANEL 1 - Space Startups*

Moderator



*Dr. Gay Yuyitung
(MILO)*

Panelists



*Jean-Francois
Gauthier (GHGSat)*



*Adam Trumpour
(Launch Canada)*



*Sohrab Haghghat
(SpaceRyde)*



*Daniel McCammon
(C6 Launch)*

*panelists bios for all panels are available at seds.ca/ascension2020



MICHAEL STRAMENGA

Student Competitions Saturday @ 1:20 p.m

Michael is a 5th year Mechanical and Management Engineering student at McMaster University. Throughout his undergraduate degree, he has held several Space related positions, including but not limited to a position at NASA JPL and Caltech. He has also been involved with the Space community at McMaster, as a member of both McMaster NEUDOSE and MERGE. These Space clubs have provided Michael with unique learning opportunities and skills that he believes are relevant to the space sector.



DEVAN WAGNER

Student Competitions Saturday @ 1:00 p.m

Devan Wagner is a Masters student, an aspiring engineer in the Canadian space industry, and the Engineering Manager for McMaster NEUDOSE, the University's first satellite mission. During his time as undergraduate in Engineering Physics & Management at McMaster, Devan was one of the original members of the satellite project which has since grown to include over 100 students and become a mission under the Canadian Space Agency with an expected launch in 2022. Now, as a graduate student, he is completing his research in Engineering Physics while continuing to manage NEUDOSE through all design phases and mentoring the next generation of space engineers and scientists at McMaster University.



ALEX SEKUNG

Student Competitions Saturday @ 1:40 p.m

Alex is an undergraduate student at the University of North Texas. He is the Vice President of SEDS UNT and is helping plan the SpaceVision 2020 conference in Fall 2020. After completing his first analogue astronaut mission, he has become more interested in deep-space technologies. Alex plans to work as an engineer, focusing on electric propulsion, or possibly an astronaut with NASA in the future.



DR. SHAWNA PANDYA

Space Exploration Saturday @ 5:15 p.m.

Dr. Shawna Pandya is a scientist-astronaut candidate with Project PoSSUM, physician, aquanaut, speaker, martial artist, advanced diver, skydiver, pilot-in-training, VP Immersive Medicine with Luxsonic Technologies and Fellow of the Explorers' Club. She holds degrees in neuroscience, space, entrepreneurship and medicine, and is currently completing a fellowship in Wilderness Medicine.

In 2015, Dr. Pandya completed scientist-astronaut candidate training with Project PoSSUM (Polar Suborbital Science in the Upper Mesosphere) and was on the first crew to test a commercial spacesuit in zero-gravity. She has flown over 140 parabolas in microgravity to date. Dr. Pandya is the lead instructor for Project PoSSUM's EVA 102: Operational Space Medicine course. Through Project PoSSUM, she completed hypobaric hypoxia training, centrifuge studies, aerobatic flight, basic and advanced emergency spacecraft egress and sea survival training, and high altitude noctilucent cloud research. Dr. Pandya also completed a tour at the Mars Desert Research Station analog in Utah, both as Commander and as Crew Health & Safety Officer. In 2019, Dr. Pandya attained her aquanaut designation during a 5-day underwater mission (NEPTUNE) at the Jules Underwater Lodge, completed the World Extreme Medicine Hyperbaric and Dive Medicine Course at Aquarius Reef Base, where NASA NEEMO missions take place, and was named a fellow of the Explorers' Club. Her adventures were recently captured in the Land Rover short, released with the Apollo 11: First Steps film.

PANEL 2 - Education and EDI (Equity, Diversity, and Inclusion)

Moderator

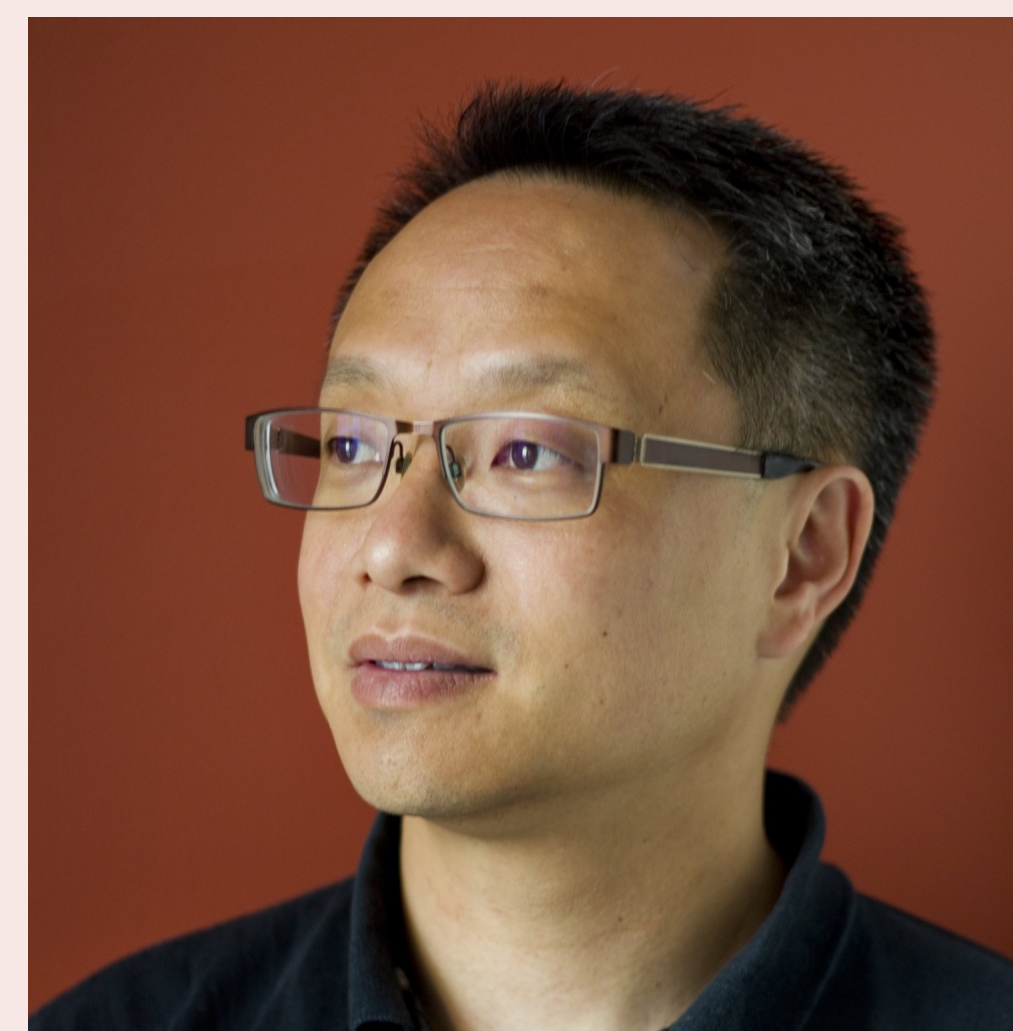


Dr. Parshati Patel
(Western U)

Panelists



Kate Howells
(The Planetary Society)



Eric Choi
(Magellan Aerospace)



Bhairavi Shankar
(Indus Space)



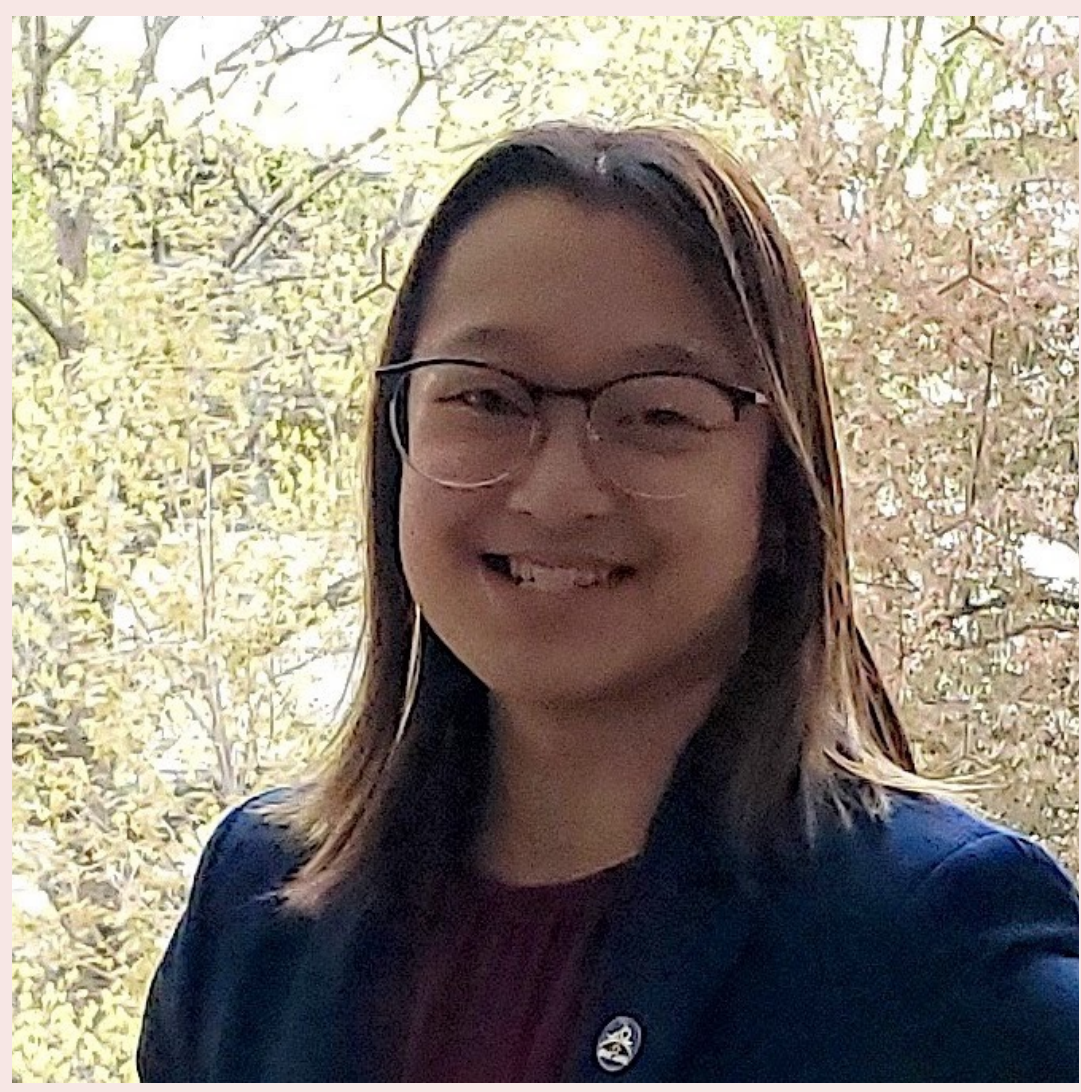
DR. MEHRAN ANVARI, MBBS, PhD, FRCSC, FACS

Remote Surgery: The Journey from the Arctic to Mars
Keynote Saturday @ 6:30 p.m.

Dr. Mehran Anvari is a tenured Professor of Surgery at McMaster University, the Chair of Minimally Invasive Surgery and Surgical Innovation at McMaster and an Adjunct Scientist for the Institute for Clinical Evaluative Sciences (ICES). He is the past president and founding member of the Minimally Invasive Robotic Association (MIRA) and the founding director of the Centre for Minimal Access Surgery (CMAS). Dr. Anvari is the Scientific Director and CEO of the Centre for Surgical Invention and Innovation (CSii), which recently partnered with MDA to create Insight Medbotics Canada Corporation (IMCC) - a start up to commercialize a new generation of intelligent robotic systems.

He is one of the first surgeons in Canada to use robotics in surgery, establishing the world's first telerobotic surgical service and has since performed multiple remote telerobotic surgeries. He is a recognized pioneer in the field of remote telesurgery and was the Primary Investigator on NEEMO 7 & 9 missions which were joint missions of the National Aeronautics and Space Administration (NASA) and Telemedicine and Advanced Technology Research Centre (TATRC). These projects evaluated the use of telesurgery in remote and hostile environments. His research over these missions initiated the development of a medical robotic system capable of programming and automation which can be controlled remotely to perform specific medical acts. IGAR is a product of the collaborative research with a number of recognized US and international researchers. Dr. Anvari is the Editor-in-Chief of the International Journal of Medical Robotics and Computer Assisted Surgery. His work with telerobotics has also been recognized by the federal and provincial government with the "Gold Medal of Distinction" and the "Diamond Award for Innovation in Technology". Most recently, Dr. Anvari was appointed to the Order of Ontario for his support in the development of medical robotics for early detection and treatment of cancers.

As a researcher, supervisor, mentor and advisor, Dr. Anvari has a continued commitment to teaching, education, publication and innovation. Dr. Anvari is the founding director of the McMaster Institute for Surgical Invention, Innovation and Education (MISSIE). He has authored numerous publications; holds several patents; and is the principle investigator of numerous studies related to obesity, gastrointestinal disease, surgical robotic systems and techniques.



LINDA DAO

Keynote Sunday @ 9:00 a.m.

Linda Dao is a Project Officer in Operational Space Medicine at the Canadian Space Agency (CSA) contributing to vision development for Canada's next space health initiatives. She received a B.Sc. in Honours Biochemistry from McMaster University and went on to the International Space University where she attended the Space Studies Program and received her Master's degree. Linda was the co-founder of the two-time award-winning McMaster Observatory Outreach at Night (MOON) Club. Linda is additionally the Education Officer of SEDS-Canada, aiming to spark greater awareness for space exploration and highlight opportunities in the Canadian space sector. In 2013, Linda won the CSA nationwide science challenge where her designed experiment was performed in the International Space Station by Chris Hadfield. Currently, Linda serves on the organizing committee for the International Space Development Conference.

PANEL 3 - Space Law and Policy

Moderator



*Aram Daniel
Kerkonian*

Panelists



Michael Pley



*Charlie Nitschelm
(SEDS USA)*



*Andrew
Simon-Butler*



*Dr. Shawna
Pandya*



KAIZAD RAIMALWALA

Going Back to the Moon Sunday @ 11:30 a.m.

Kaizad works at Mission Control Space Services, a space exploration and robotics company with a focus on mission operations, onboard autonomy, and artificial intelligence. He has Bachelors and Masters degrees in aerospace engineering from Purdue University and the University of Toronto. Kaizad joined Mission Control in 2016 as a robotics engineer, contributing to the development and analog field testing of advanced technologies in perception, path planning, and mission operations for planetary rovers, while also supporting other activities such as mission design, systems engineering, and STEM education through Mission Control Academy. He now works in product and business development to support the growth of Mission Control as a commercially focused space tech company that aims to offer novel software solutions for next-generation space missions. His previous experience includes 6 years of service at SEDS national organizations, including Vice-Chair at SEDS-USA, followed by re-starting and leading SEDS-Canada as Chair and Chief of Staff, and co-founding SEDS programs such as CAN-RGX.



ELIAS SOLORZANO

Going Back to the Moon Sunday @ 11:05 a.m.

Elias is an aerospace engineer at MDA, where he supports robotic operations using the Canadarm-2 and Dextre manipulators onboard the International Space Station (ISS), and the development of advanced dexterous-robotic solutions for extreme environments on Earth, the Moon and beyond. He completed his Master of Applied Science at the University of Toronto's Space Flight Laboratory, where he specialized in end-to-end spacecraft development and testing. He previously served as President of SEDS-Canada in 2017, and co-founded Canada's reduced experiment design challenge (CAN-RGX). He's an avid scuba diver, pilot in training and outdoorsman.

PANEL 4 - SGAC Panel: Space for a New Generation - Harnessing the Creative Economy

Moderator



*Zaid Rana
(SGAC)*

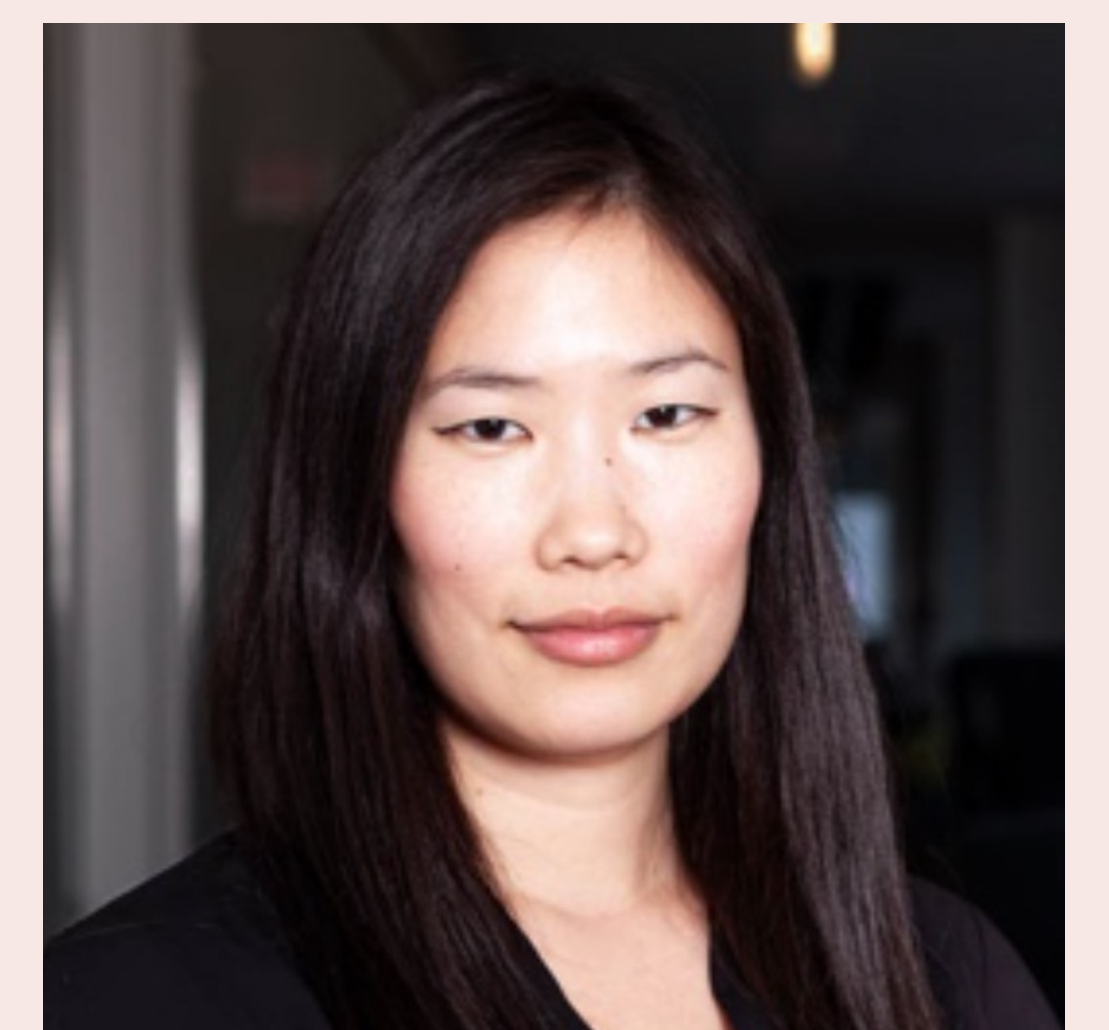
Panelists



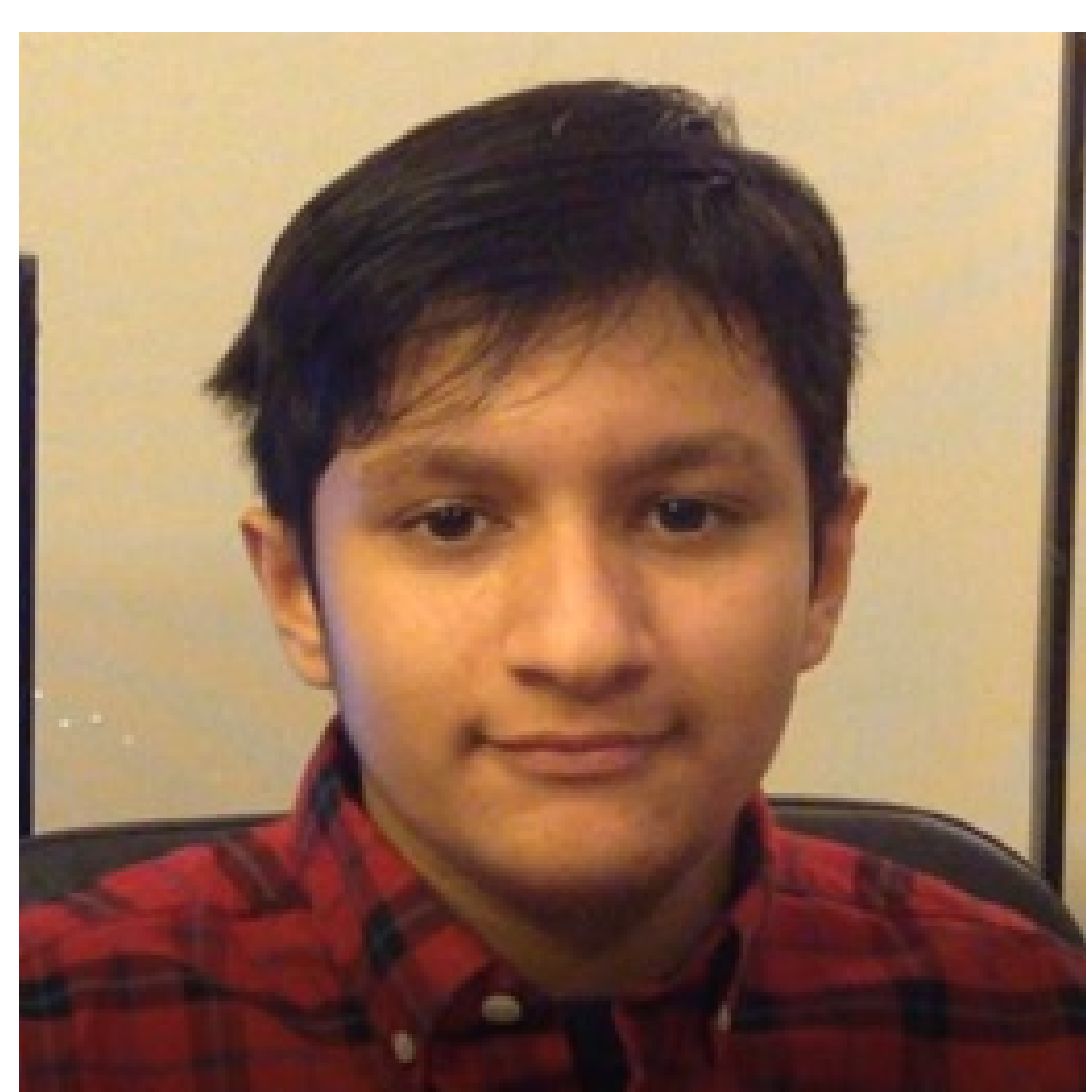
*Kaizad Raimalwala
(Mission Control Space
Services)*



Michael Pley



*Andrea Yip
(Luna Design and
Innovation)*



ARTASH NATH

Advancing Technologies Sunday @ 2:25 p.m.

I have been working on Space, Robotic and Machine Learning for the last 5 years. I am interested in deep space exploration and have been applying machine learning to space challenges, including: predicting risk index of asteroids colliding with Earth, detecting atmospheres of exoplanets, and object mapping by autonomous rovers using stereotypic vision.

I have presented my machine learning projects at several conferences including the 2020 Innovation Nation Conference, the 2019 Planetary Defense Conference in Washington DC where it won the Honorable Mention Award, the 2019 Montreal Space Symposium, and the 2018 Toronto Machine Learning Summit. I participate in Kaggle and citizen science challenges on astronomy and machine learning. I was one of the winners of the Ariel Machine Learning Data Challenge and presented my project at the ARIEL: Science, Mission and Community 2020 Conference in the Netherlands. I am the winner of the NASA SpaceApps Challenge Toronto 2018, 2017, 2014 as well as the 2018 Imagining the Skies, and the 2017 Jesse Ketchum Award of the Royal Astronomical Society of Canada.

In 2014, I co-founded the HotPopRobot.com Initiative to carry out youth to youth science communication and outreach on space and carry out several free workshops and events each year.



SHIRA JACKSON

Advancing Technologies Sunday @ 2:50 p.m.

Shira Jackson is a PhD candidate at the University of Toronto studying experimental quantum optics. She's currently working on the construction of two-photon optical clocks for field- and space-based fundamental physics investigations. In August 2019, Shira participated in the CSA's Strato-Science campaign to launch a compact optical atomic clock on a stratospheric balloon. When not in the lab playing with lasers, she's busy with her two little children.

PANEL 5 - Off the Record

Moderator



*Hira Nadeem
(SEDS Canada)*

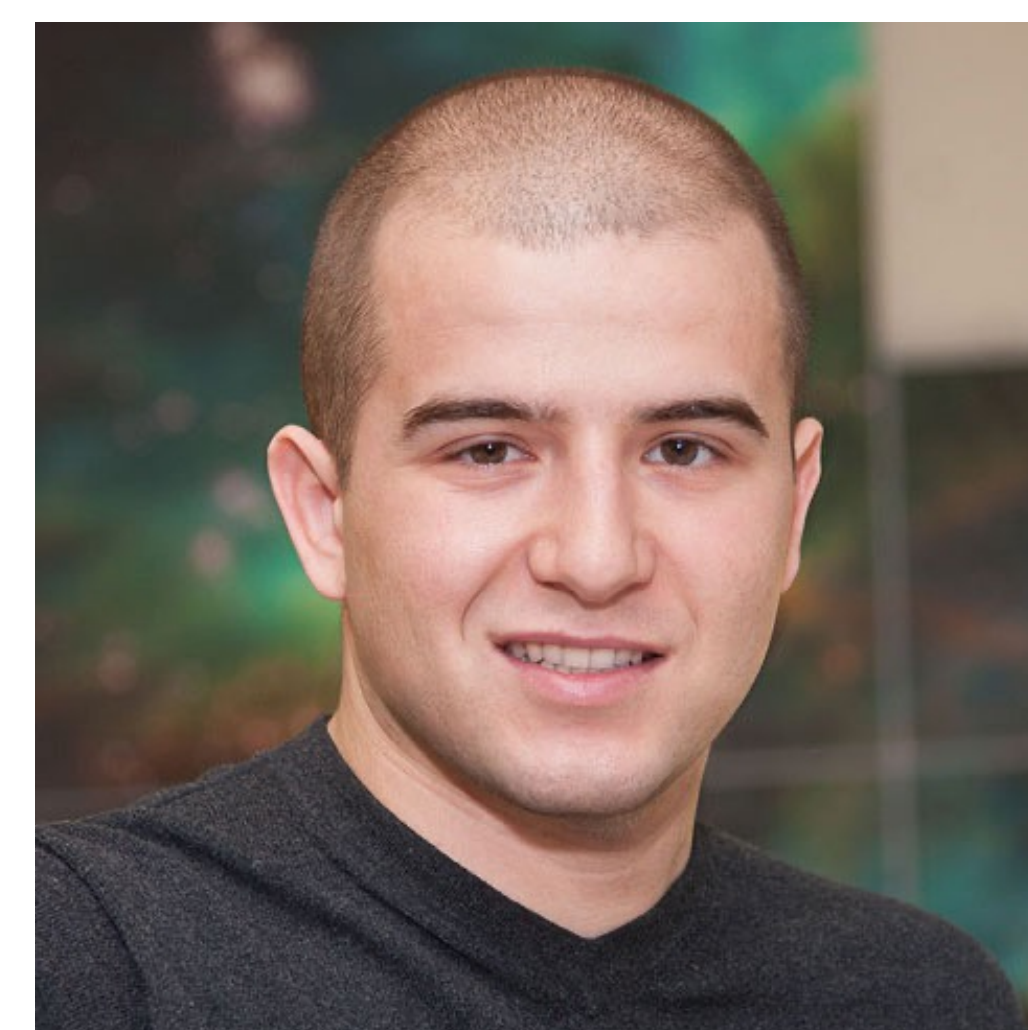
Panelists



*Marianne Mader
(CASC)*



*Vanessa Lewis
(Kepler)*



*Andrei Hanu
(McMaster U)*



*Thomas Sears
(Queen's U)*



ALLYSON BRADY

Keynote Sunday @ 4:05 p.m.

Allyson is currently a research scientist in the School of Geography and Earth Sciences at McMaster University. She holds degrees in microbiology (B.Sc. Guelph), bioarchaeology (M.A. Western) and earth science (PhD McMaster) and is actively involved in astrobiology research and the development of mission concepts of

operations for human exploration. Her main area of interest is in understanding how life can thrive in extreme environments on Earth, how that information translates into searching for evidence of life on other planets such as Mars and what signs of life might be left behind once that life is no longer there. Understanding how to identify and interpret these signs is key for the space science community to effectively plan future space missions including those that will target sample collection.

Allyson has over 10 years of experience working in analogue environments - settings on Earth that simulate conditions on other planets - to try and tackle these questions. She has participated in several NASA and Canadian Space Agency supported research programs focused on not only detecting signs of life but understanding how to effectively integrate scientific research activities into crewed space missions. Her work has taken her to field sites in the Antarctic, hotsprings in Western Canada, volcanoes in Hawaii, and piloting single-person submersibles underwater in B.C. She hopes that the insights gained through studying these environments will be used to help guide human scientists and explorers on Mars or other planets.

We're continuing a tradition started during Ascension 2019: we're donating money to a conference-attendee-selected charity on behalf of our speakers, in lieu of speaker gifts. We'll be holding a live vote during the conference to select the charity of our attendee's choice.

Here is some info about the four registered charities attendees have to choose from:

LET'S TALK SCIENCE (www.letstalkscience.ca)

Let's Talk Science (LTS) is committed to preparing Canadian youth for future careers and citizenship demands in a rapidly changing world. LTS help's Canadian youth build the skills they need for their - and Canada's - future success. Through STEM education LTS is helping youth learn to take risks, develop the persistence to find innovative solutions to real world problems, and the competencies required to thrive in an ever changing world.



SPACE MATTERS (www.spacematters.ca)

The goal of Space Matters is to use a connected-learning approach to foster dynamic collaborations among schools, out-of-school time programs, STEM expert institutions (e.g., museums, science centres, universities), the private sector, community-based organizations, youth and families, using Space as the connecting topic. Space exploration, perhaps like no other discipline, can ignite interest and motivate youth to appreciate science and technology in their daily lives and to pursue education and careers in the sciences, engineering and high-tech sectors.



CANADIAN SPACE SOCIETY (www.css.ca)

Founded in 1983, the Canadian Space Society (CSS) vision is to lead Canada in the effective cooperation between industry, government, academia, advocacy groups, and the public for the advancement of space endeavours. CSS's mission includes informing members and the public about Canada's activities in space within the context of the broader international community, educating individuals on space exploration, discovery, innovation and its values, and shaping space policy, among others.



hEr VOLUTION (www.hervolution.org)

Based in Toronto, Canada, hEr VOLUTION is the go-to place for youth, particularly young women from underserved communities, to come to in order to advance in 21st Century Skills. hEr VOLUTION exists to create opportunities for the next generation of women in STEM connecting them with leaders in the industry for career support. Needs of the community and that of the STEM industry are heeded to better help the next generation of underserved youth, with a focus on young women in STEM.



Student abstracts

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Six students were selected to give short talks based on a competitive abstract submission process. Abstracts are available online at seds.ca/ascension2020. Students will present their work in one of two rooms (presentations are listed in order):

Room 1



ARIELLE AINABE, McMaster University

Tardigrade Mech: Boron Nitride Nanotube Composites for Space Radiation Protection

VICTORIA FLOOD, University of Guelph

The Mars Science Laboratory Rover, CURIOSITY - Mission, findings, and operation



**JEFF KIM (Pictured), MOLLY LU, ALYSSA ANG,
SHAWN LOBO, PRIYA JAIN**

WatLock, University of Waterloo

A Modular Habitation System for Mars Colonization

Room 2

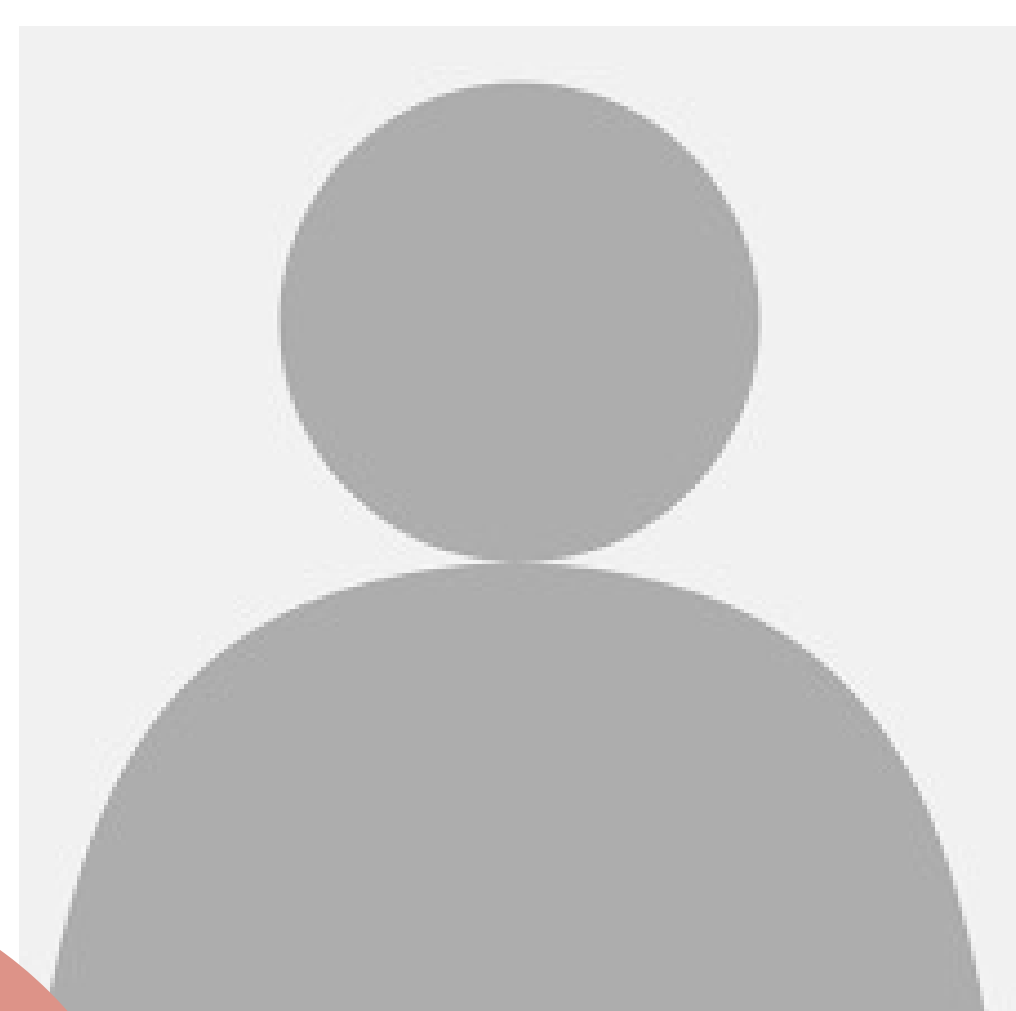


KIRTAN DHUNNOO, UAlberta Space Design Group, University of Alberta

Determining response differences to microgravity in male and female bioengineered cartilage tissue

ADDY BHATIA, University of Toronto

Design of a Novel Method for Realtime In-Situ Lunar Sample Analysis



TAMJEED ELAHEE, uO Rocketry, University of Ottawa

Cross-Platform Analysis of Antibiotic Resistance in Microgravity

Build your company! Led by Tammy Hwang, a business development officer and startup advisor for the city of Hamilton and her company CoMotion on King, your task will be to form a business idea out of keywords selected to boost your creativity. You'll learn what should go into a business idea, and how to pitch it! Take part in this fun and informal workshop to get your feet wet with the entrepreneurial spirit.

Meet TAMMY HWANG



Tammy Hwang is a passionate Hamiltonian and City Builder. By day, she works for the City of Hamilton in Economic Development's Global Hamilton Office helping immigrant business owners access city resources and generally spreading the good word about Hamilton internationally. Tammy has helped launch programs like "Land in Hamilton", a soft landing program for international firms to experience and learn about starting/expanding a business in Hamilton, Hamilton's International Delegation Protocol, and supporting Hamilton's Foreign Direct Investment Strategy to make Hamilton a top international destination for investment and economic development. Tammy also helped Hamilton achieve Top7 Intelligent Community status and is an active and engaged cheerleader for Hamilton's technology, smart city initiatives, and our thriving startup ecosystem. In her evenings and weekends, she is the CEO of CoMotion Group, a small business that runs CoMotion on King; a coworking space for small businesses, freelancers, and solo entrepreneurs. She is passionate about building Hamilton as a globally recognized intelligent community.

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STARSCAPE CREATIVE

Starscape Creative's mission is to utilize the visual arts (Space Art) as a medium to engage, inspire and ignite curiosity about outer space and its benefits.

 www.starscapecreative.com

 StarscapeCreative

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MCMASTER PLANETARY SOCIETY

The McMaster Planetary Society is focussed on encouraging students to know their place in space and have the ability to explore it.

 McMasterPlanetarySociety

 @McMasterSpace

SEDS-CANADA

See Page 1 for an overview of SEDS-Canada.

We are always looking for eager students to join us and help contribute towards a brighter space sector. With your addition to the cumulative enthusiasm at SEDS-Canada, we can make leaps and bounds in achieving our goals.

SEDS-Canada members will elect a new Board of Directors in April. Board of Director positions directly influence the activities SEDS-Canada participates in, and as a student-run organization, must be filled exclusively by students. These positions are:

President, VP Internal, VP External, VP Finance, Director at Large, Projects Chair, Events Chair

Staff members are an integral part of SEDS-Canada. All of our projects are directly managed by staff members, who then report to a specific Director. Although the Board of Directors must be composed entirely of students, staff do NOT need to be students. We have the following open volunteer staff opportunities available at SEDS-Canada:

NASA Space Apps Toronto Coordinator, NASA Space Apps Toronto Youth Coordinator, Chief Recruiting Officer, Crowdfunding Campaign Manager, Graphic Designer, Content Manager, Webmaster, CAN-RGX Assistant Project Manager, Social Media Manager

Visit seds.ca/join for more information (including roles and responsibilities of positions listed here)!

 www.seds.ca

 SEDS-Canada

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