MDA SPACE

SHIFTKEY LABS

Canadian Space Agency | Agence spatiale canadienne

WELCOME TO THE MISSION ACCEPTED!

SPACE HACKATHON

OCTOBER 24 - 26, 2025

GOLDBERG COMPUTER SCIENCE BUILDING

SCHEDULE

Oct 24th

5pm: Doors open & registration
6pm: Kick-off presentation
7pm: Team formation
7:30pm: Dinner & work time

Oct 25th

9am: Doors Open
10:30am: Using the EODMS (workshop)
11:30am: Tips for Team Success (workshop)
12:30pm: Lunch
1:30pm: Intro to Orbits (workshop)
7:15pm: Dinner

Oct 26th:

9am: Doors open
12:30pm: Lunch
3:00pm: Submission deadline
3:30pm-6:00pm: Presentations & judging

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SCHEDULE

Using the EODMS

Presenter: Dalia Laoubi

Demonstration of how to use the EODMS to order imagery from RADARSAT-2, RCM etc. Imagery can be used for hackathon challenges.

Tips for Team Success

Presenter: Adam Fowler

A quick overview presentation distilling some software development industry practices to help improve team cohesion, solution design, and development efficiency. This will also give the students some insight into using these techniques preparing them to enter the industry.

Intro to Orbits

Presenter: Adrienne Hynes

Even wondered about the dynamics of a satellite orbiting the Earth? Join for a brief intro in orbital mechanics including what can be accomplished using various orbits.

WHO IS MDA SPACE?

With a 55-year+ record of firsts and 450+ missions, MDA Space is a trusted space mission partner to the rapidly expanding global space industry. Spanning communications satellites, Earth and space observation, and space exploration and infrastructure, our expertise and innovations are enabling some of the most ambitious missions happening today and making possible our customers' bold visions for tomorrow.

Building the space between proven and possible, our 3,800 employees globally are pushing boundaries, tackling big challenges, and imagining solutions that inspire and change the world for the better.

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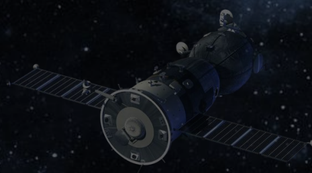
WHO IS SHIFTKEY LABS?



ShiftKey Labs is a non-profit organization that empowers students across Atlantic Canada to enhance their tech skills and achieve professional success.

From AI and Web Development to Cybersecurity and Game Design, our team shares expertise from within the tech community, enabling students to expand their skills and network with industry professionals.

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WHO IS CSA?

Role of the Canadian Space Agency in Space Utilization

Earth Observation

The **CSA** designs and operates missions the **RADARSAT Constellation Mission**, using powerful radar to watch over our planet — **day or night, rain or shine!**

Their data help to:

- Track climate change & Arctic ice melt
- Manage forests, oceans, and natural resources
- Support emergency response to floods, wildfires, and natural disasters

Space Applications & Open Data

The **CSA** makes space data **open and accessible** for researchers, businesses, and governments — inspiring innovation here on Earth.

Examples:

- Precision agriculture
- Smart urban planning
- Safer maritime navigation
- Infrastructure monitoring

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CHALLENGE 1

CANADA HAS THE LARGEST COASTLINE OF ANY COUNTRY IN THE WORLD, BUT IT IS NOT IMMUNE TO THE EFFECTS OF A CHANGING CLIMATE. OUR COASTLINES FACE INCREASED RISKS AS THE CLIMATE CHANGES; RISING OCEAN TEMPERATURES, INCREASED PREVALENCE OF ONCE-IN-A-LIFETIME WEATHER EVENTS AND MELTING ICE OPENING UP NEW TRADE ROUTES TO NAME A FEW. THERE ARE 4 ACTIVE CANADIAN EARTH OBSERVATION MISSIONS SO….

How can we use satellite data to help protect Canadian shorelines?

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CHALLENGE 2

NEARLY 100 SATELLITES FLYING THE CANADIAN FLAG HAVE BEEN LAUNCHED, 30+ OF WHICH ARE STILL ACTIVE TODAY. MDA SPACE BUILT SAPPHIRE HAS BEEN IN ORBIT FOR 12 YEARS, AND MDA SPACE OWNED AND OPERATED RADARSAT-2 HAS BEEN IN ORBIT FOR 17 YEARS. THEIR ORBITAL POSITIONS ARE TRACKED, BUT DO YOU KNOW THE STATUS AND LOCATION OF THESE SPACECRAFT?

Create an application showcasing Canadian spacecraft in orbit

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CHALLENGE 3

WITH SPACE, THE SKY IS NO LONGER THE LIMIT. THE ACCOMPLISHMENTS OF SPACE MISSIONS TODAY WOULD NOT HAVE BEEN THOUGHT TO BE POSSIBLE 100 YEARS AGO. DESIGN A SATELLITE MISSION YOU WOULD LIKE TO SEE LAUNCHED. THIS CHALLENGE SHOULD INCLUDE SPECIFICS SUCH AS:

- WHAT IS THE PURPOSE OF YOUR MISSION?
- WHICH SENSORS DID YOU CHOOSE AND WHY?
- WHICH ORBIT WILL YOU LAUNCH INTO?
- WHICH ALGORITHMS WILL BE USED ON BOARD? (AND CAN YOU DESIGN A PROTOTYPE?)

Put your creativity to the challenge to design and propose the next mission

RESOURCES

EODMS

CSA Gitlab

SpaceTrack

Celestrak

CADC

Note: Teams are welcome to use any other Open-Source dataset independently found

SUBMISSIONS AND PRESENTATIONS

- Maximum team size of 5 is recommended
- Presentations will take place 3:30 – 6 pm on Sunday
- The submission deadline is 3:00pm
- Each group will have 5 minutes to present, including a demo (if applicable)
- Each group must submit a one paragraph overview of their project including a list of your team members, any presentation materials and code
- Submission link to be shared soon
- The panel of judges will be comprised of a representative from the CSA and three senior MDA Space employees

RUBRIC

		Poor				Good
Problem/Solution Definition	How clearly the team identifies and understands the problem/solution they are solving.	1	2	3	4	5
Problem Relevancy	Is the scope and feasibility of the problem apparent and is it suitable given the challenges context.	1	2	3	4	5
Problem Significance	How impactful is the problem, is it important given the context of challenges.	1	2	3	4	5
Solution Feasibility	Does the final solution technically adhere with the team's approach, did technical decisions create positive impacts on the approach.	1	2	3	4	5
Solution Viability	Does the final solution harmonize with the goal of the challenge, is the scope aligned with what could be accomplished.	1	2	3	4	5
Solution Originality	Consider the uniqueness and creativity of the solution. Does it leverage something unexpected or solve it differently.	1	2	3	4	5
Problem-Solution Coherency	Does the problem the team set out to solve get accomplished with the final solution.	1	2	3	4	5
Team Presentation	How well did the team present, did everyone contribute, were the ideas presented clear.	1	2	3	4	5

PRIZES

MDA Space will award gift cards to the top three teams in the amounts of…

$500

$1000

$250

2nd place team

1st place team

3rd place team

MENTORS

ADAM

- Full stack software development experience
- Software design/architecture, automated deployment, & cloud infrastructure knowledge

ADRIENNE

- Background in Aerospace Engineering (satellite, ground station and mission design)
- System Engineering, interface design, spacecraft and orbit knowledge

BEN

- Software developer on distributed systems
- Software architecture, distributed programming and project planning

MENTORS

DALIA

- Mission planner, Working on disaster monitoring (hurricanes, volcanoes, Floods etc.)
- Acquisitions / Processing of satellite imagery. Development of applications / Strategic planning and engagement.

KAVIN

- Software developer working full stack on various projects
- Software design/architecture, specialty in Angular and frontend, project management

RYAN

- Bringing machine learning based prototypes to production.
- Geospatial / satellite imagery, microservices, data pipelines, machine learning experiments / application.

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QUESTIONS?

Mentors will be on site from start until dinner on Saturday and all-day Sunday.

Questions can also be directed to the Discord channel

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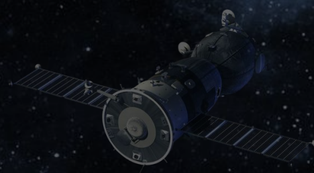

THANK YOU!