

# EMIRATES LUNAR MISSION

## **Mission Control is flying to the Moon!**

Mission Control will demonstrate a cutting-edge AI-integrated flight computer on the Emirates Lunar Mission (ELM), an international micro-rover mission led by the Mohammed Bin Rashid Space Centre in the United Arab Emirates, launched on a SpaceX rocket and delivered to the Moon by ispace of Japan in 2022.

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### **Demonstrating Advanced Computing Technologies**

Mission Control and subcontractor Xiphos Technologies will fly a modern flight computer as a payload on the ispace lander. This payload will host an Artificial Intelligence (AI) application that will classify types of lunar geological features visible in images from Rashid, the rover in the Emirates Lunar Mission, as it drives around the lunar surface.

As the first demonstration of Deep Learning beyond Low Earth Orbit (LEO), this will be a historic milestone in space exploration. In traditional missions, such analysis would be performed by powerful computers on Earth; however this limits the capabilities of a rover to perform actions such as navigation autonomously. By introducing this AI technology in an edge computing architecture for a lunar mission for the first time, we will unlock new capabilities in science-driven robotic exploration.

The outputs of this AI will be transferred back to Earth, where we will use our cloud-based Mission Control Software platform to distribute mission data to our science team in real-time. This will enable our mission science team to seamlessly and securely interface with the spacecraft to support a variety of experiments.

### **Enabling Canadian Scientific Discovery**

Mission Control will lead a series of research investigations with support from academic partners at Concordia University, University of Winnipeg, Western University and Carleton University.

The primary investigation will demonstrate how automated terrain classification can be used to support engineers and scientists who are operating lunar rovers in a fast-paced working environment. This will include using the identification of geological features to inform operators about potential hazards faced by the rover, and to help operators plan paths for the rover to drive.

## Follow us to the Moon

Mission Control is pleased to work with a stellar team of partners focused on educational outreach and public engagement: SmartICE, Rocket Women, and SEDS-Canada (Students for the Exploration and Development of Space). Together with our partners, Mission Control will engage students, underserved communities, and the wider public in what promises to be one of the first demonstrations of Canadian computing technologies on a lunar mission. By creating iconic moments for Canadian space exploration, we aim to inspire the next generation to reach for the stars.

Follow us on our social media channels to get the latest updates as we get ready to fly to the Moon, and we'll make sure to bring you along with us!

### We're Going to the Moon!!

Mission Control is participating in the Emirates Lunar Mission that will fly a small rover called Rashid to the surface of the Moon in 2022. We will demonstrate next-gen technologies for lunar exploration!

- AI-based Terrain Classification**  
First demonstration of deep learning technology in a lunar mission. Our AI will identify surface features to aid mission operators
- Advanced Rover Navigation**  
We will help mission scientists navigate the rover with our advanced robotics technologies
- Mission Control Software**  
Our cloud-based mission operations platform will enable the Canadian science team to easily and securely access mission data
- Enabling Scientific Research**  
We're enabling Canadian scientists and engineers to make novel contributions to lunar exploration
- Follow us to the Moon**  
Stay tuned for our exciting initiatives in Education & Public Outreach to bring students and the public along with us to the Moon

**MISSION CONTROL**  
SPACE SERVICES INC.

**Outreach Partners**

SEDS-ÉEDS ROCKET WOMEN SMARTICE

**Canadian Science Team**

THE UNIVERSITY OF WINNIPEG Carleton UNIVERSITY Concordia UNIVERSITY Western Institute for Earth & Space Exploration

**Mission Partners**

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