A BELGIAN ROVER PROVIDING COMMERCIAL LUNAR PAYLOAD MOBILITY

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Switch to Space 5, 18 November 2026

SPACE APPLICATIONS SERVICES



Our capabilities cover ground segment and control centres, platform and payloads, avionics, advanced robotics and mechanisms

We regularly deliver and operate payloads in LEO with the ICE Cubes service

We also provide services including scientific, engineering, mission integration and astronaut training

+120
EMPLOYEES

BELGIAN
COMPANY WITH INTERNATIONAL OFFICES

FOUNDED
IN 1987

EN 9100
CERTIFIED

Space Applications Services NV/SA is a private Belgian company

The company is headquartered in Belgium with a subsidiary, Aerospace Applications North America in Houston, USA and an office in the Netherlands close to ESTEC, In Germany and Luxembourg

The company facilities include clean room, laboratory, integration bay and control centre

3 OUR MISSIONS FOR SPACE

End-to-end LEO services & infrastructure



IP based avionics
Hi reliability for Lunar & LEO environments
Microgravity payloads
LEO payload delivery & operation service

In-orbit Servicing & Robotics



Low mass manipulator
Mobility through walking
Multi-arm manipulators
Standard connecting devices
High reconfigurability

Lunar payload delivery & mobility



Adaptive suspension
Proven in analogue environment
PSR capable
Lunar payload delivery and operation service

Lunar In-Situ Resource Utilisation



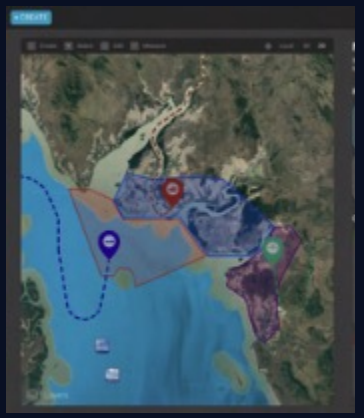
Oxygen extraction processes
High temperature reactors
Regolith acquisition & handling
Design for lunar environment

Ground segment



Complete ground segment
Mission control
Mission Planning
Data processing automation

Intelligent multi-robot operation



Mission Control (C4I)
Multi Agent Planning & simulation
Data Fusion
Advanced communications
UAVs, USVs, AGVs

THE LUVMI-M ROVER FAMILY AND HERITAGE



LUVMI

Volatiles sampler and analysis developed to TRL 5



LUVMI-X

Evolution of LUVMI for remote analysis of volatiles

Includes propellable and droppable payloads



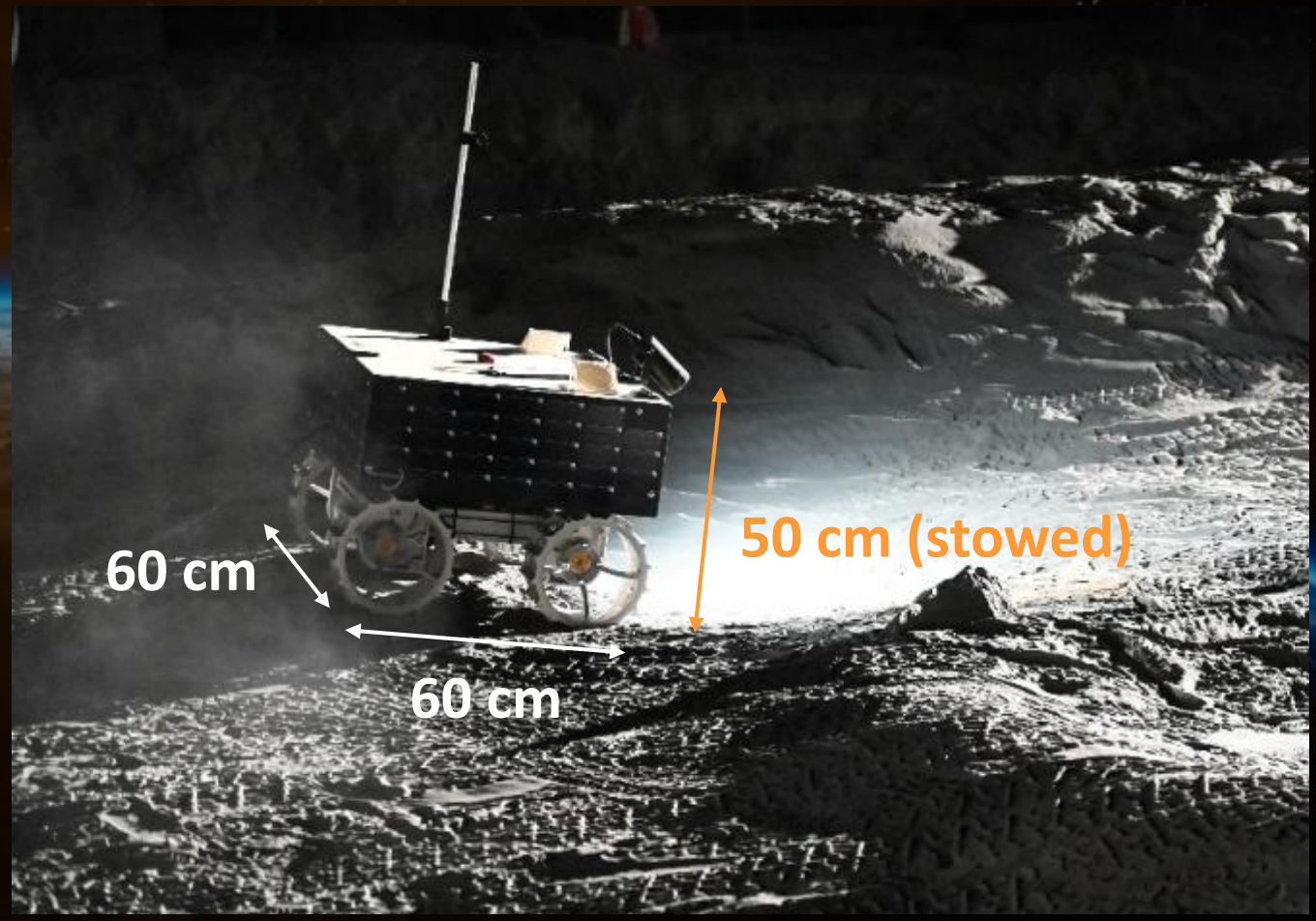
LUVMI-M

Commercial rover platform to support lunar science

Currently being built and tested

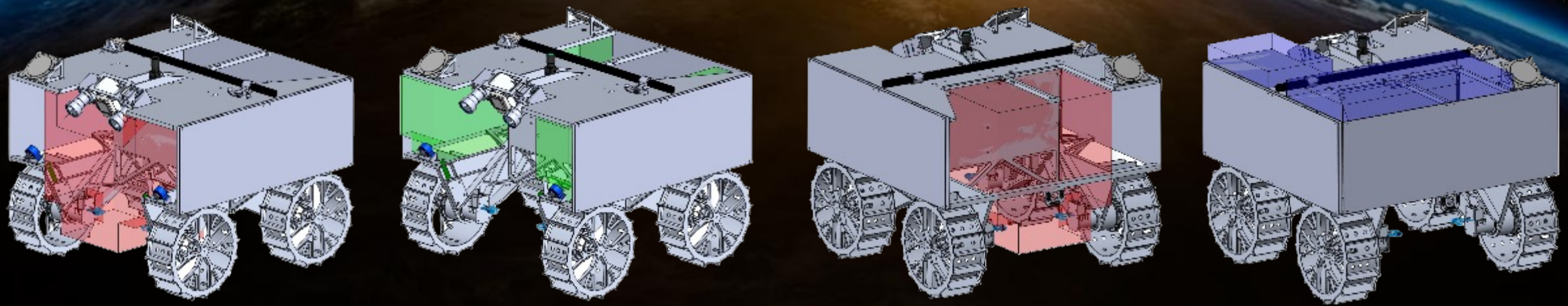
LUVMI-M OVERVIEW

- Lightweight, cost-effective design
- 40 kg rover
  - 20 kg platform
  - 20 kg payload capacity
- Sized for lander compatibility
- Polar and mid-latitude configurations
  - Solar panels on three sides, with option for added deployable panel
  - Radiator on top surface
  - Antennae for communications link to lander + orbiting relay



PAYLOAD MOUNTING

- Designed to maximise payload accommodation capabilities
- Multiple payload bays available in various configurations / orientations
  - Direct views down to lunar surface
  - Direct views up to deep space
  - Views at the front / rear of the rover to the surrounding environment
  - Internal accommodation



PAYLOAD INTERFACES

- LUVMI-M offers the following baseline interfaces to payloads:

Mass	Up to 20 kg (shared)
Interfaces	5 V, 12 V, 28 V lines CAN, RS422, SpaceWire, Ethernet
Power	50 W average available; up to 250 W peak (shared)
Data	100 kbps downlink, 10 kbps uplink (shared)
Surface Temp.	-50°C ... +50°C, heaters available where necessary
Transit	Limited power and data available to payloads
Mission 1	10 – 14 days; at the lunar South Pole

- Higher power to individual payloads can be provided for short durations
  - To be determined on a case-by-case basis and agreed between SpaceApps and customers

- More details can be found in the user guide – request via moon@spaceapplications.com

MISSION 1

- LUVMI-M operates for one lunar day
  - 10 – 14 Earth days total
  - Traversal distance of 3 – 5 km
  - Roving speed of up to 5 cm/s
  - Able to navigate slopes of up to 15°
  - Redundant communication links
- LUVMI-M Mission 1 will land at and traverse the South Polar region
  - **Q1 2029 launch**
  - **Blue Origin Mk1 lander**
  - Up to 30 stops at sites of interest
  - Possibility for PSR excursions of 2 – 3 hours (subject to thermal / energy budgets)
- Subsequent missions once every two years



Co-funded ESA GSTP activity for rover platform development
Mission 1 is a commercially funded opportunity

MISSION 1 TIMELINE



ROVER MISSION CONTROL CENTRE

- Payloads will be operated from the Rover Mission Control Centre
  - Existing centre in SpaceApps' headquarters in Belgium – will be upgraded
  - Mission control architecture based on Yamcs
  - 7+ years experience operating ISS payloads via SpaceApps' ICE Cubes service



CURRENT STATUS

- **April 2026**: locomotion and navigation tests in LUNA
- **July 2026**: successful PDR with ESA
- Now: assembly of the Structural and Thermal Model
- **November 2026**: vibration and shock tests on STM
- **January 2027**: thermal vacuum test on STM



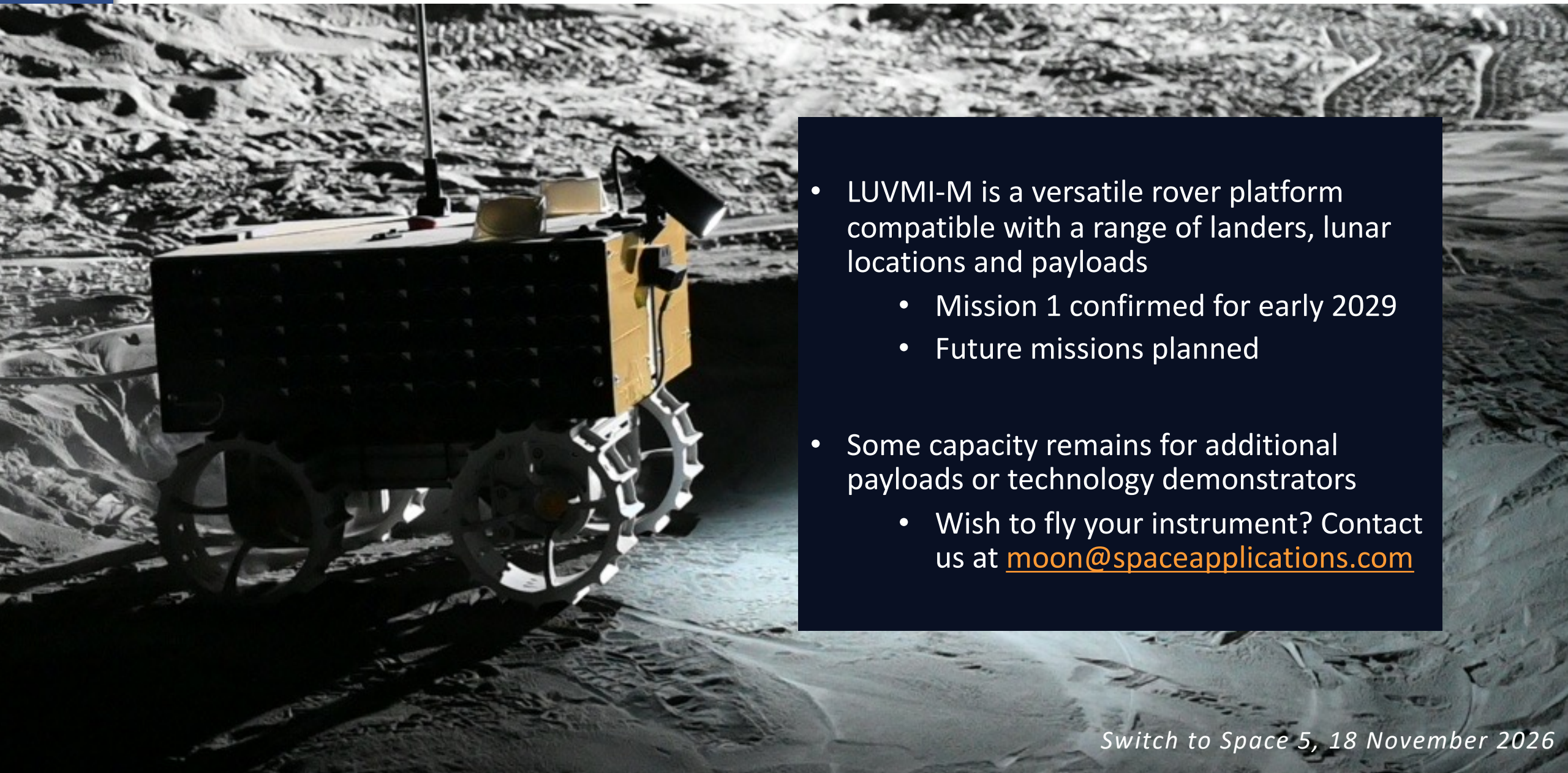


LOCOMOTION AND NAVIGATION TESTS

- Locomotion Performance Model
- Tests campaigns performed at:
  - SpaceApps' Moon Yard
  - LUNA facility in Cologne
- Locomotion tests:
  - Terramechanics validation (slip ratio, torque, etc.)
  - Steering accuracy and calibration
  - Obstacle handling (rocks, craters)
  - Slopes up to 22° uphill, downhill and sideways
  - Lateral forces
- Teleoperated navigation tests in low illumination conditions



SUMMARY



- LUVMI-M is a versatile rover platform compatible with a range of landers, lunar locations and payloads
  - Mission 1 confirmed for early 2029
  - Future missions planned
- Some capacity remains for additional payloads or technology demonstrators
  - Wish to fly your instrument? Contact us at moon@spaceapplications.com

THANK YOU!



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Business Developer Flight Systems

Space Applications Services

Contact us at moon@spaceapplications.com