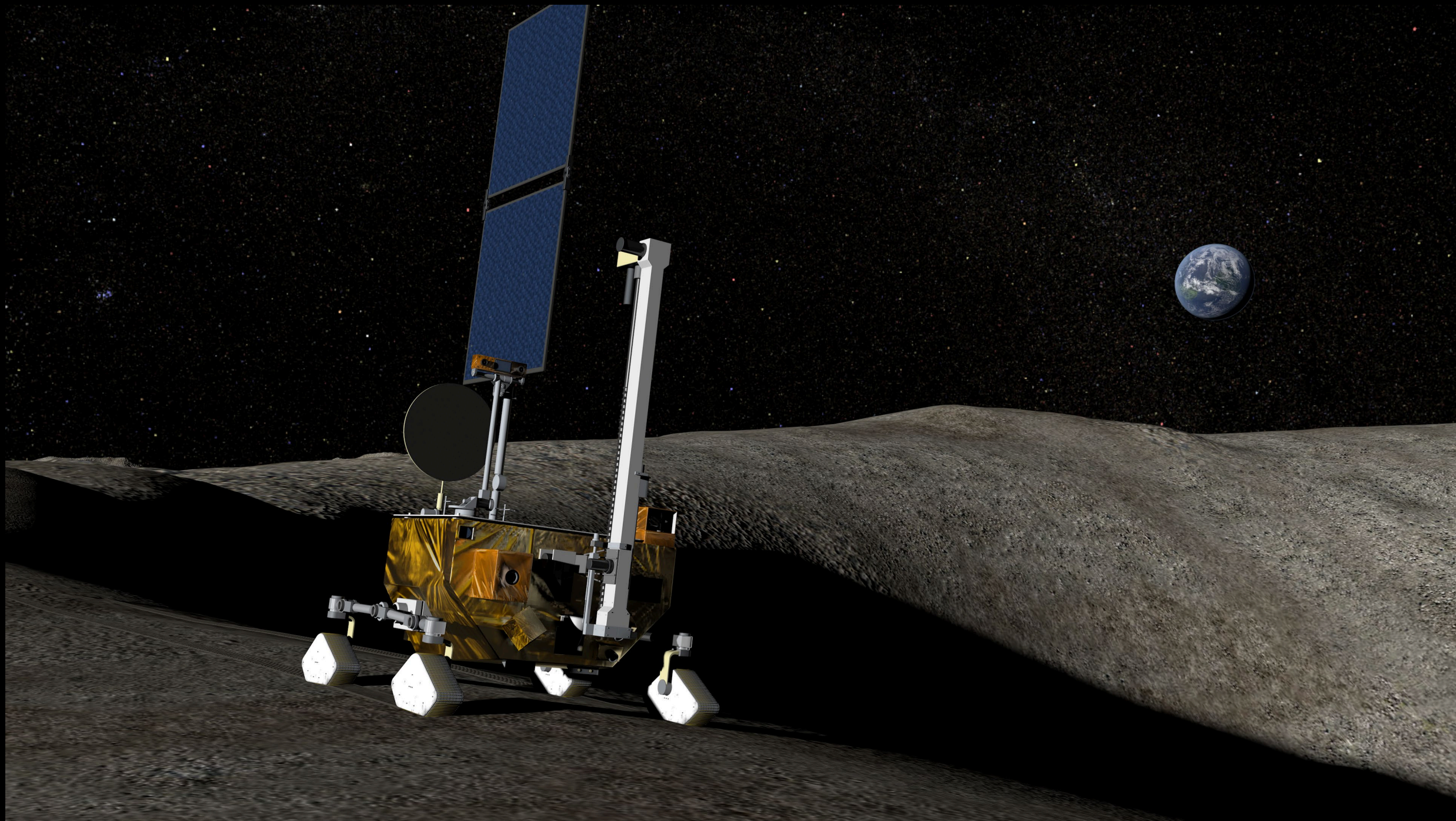


Moon Manned	LUPEX	Pressurized Manned Rover	Large Cargo Lander
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<Direct contribution to ARTEMIS, focus on polar region>





2030

2040

Mars

MMX

MarsLandingStep1

MLStep2

MLStep3

Moon

SLIM

Unmanned

LEAD program

<tech for OK-sized exploration>

Commercial lunar exploration

Moon

Manned

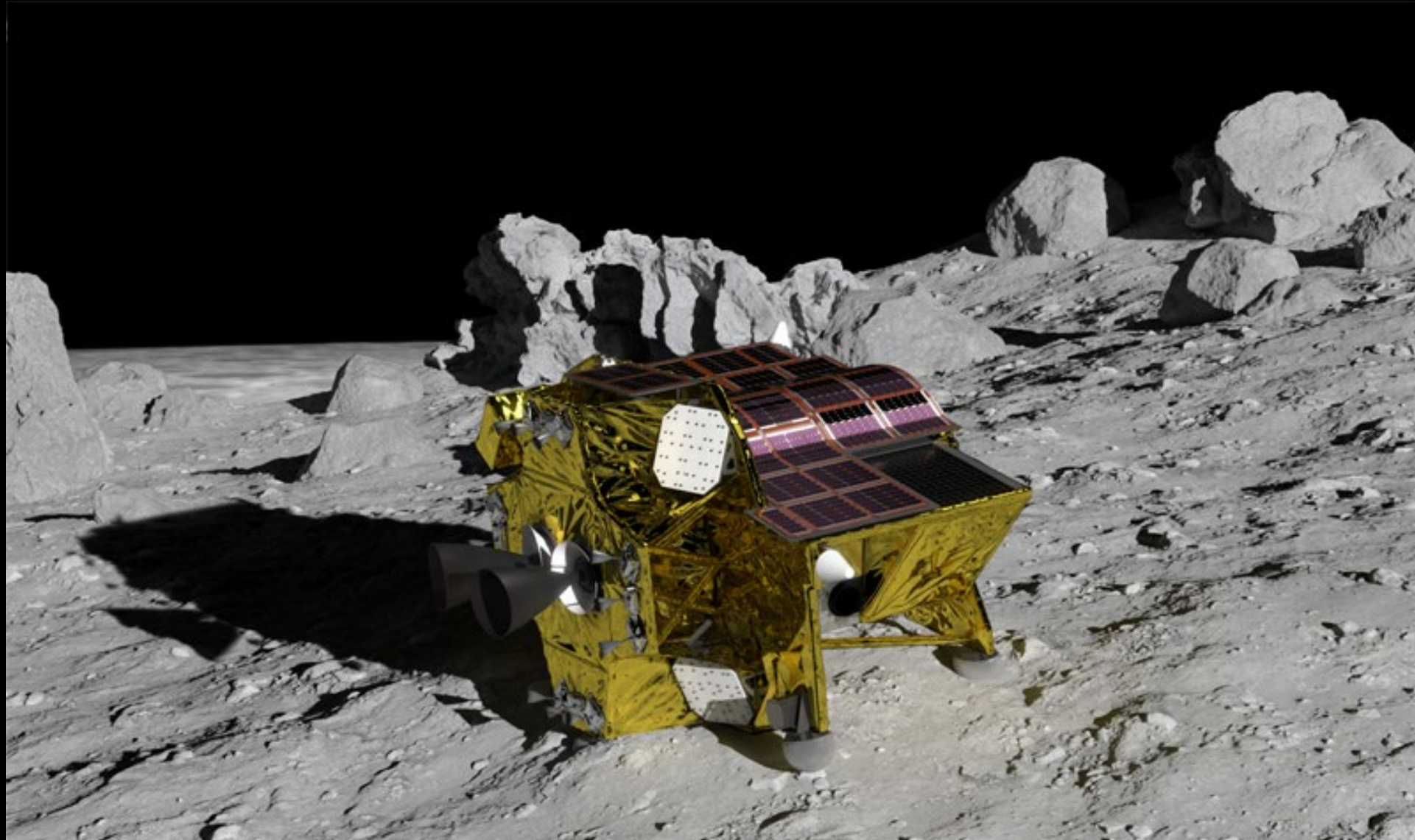
LUPEX

Pressurized Manned Rover

Large Cargo Lander

<Direct contribution to ARTEMIS, focus on polar region>

SLIM: small lander, pin-point landing, two-staged scheme for landing on a slope



LEAD

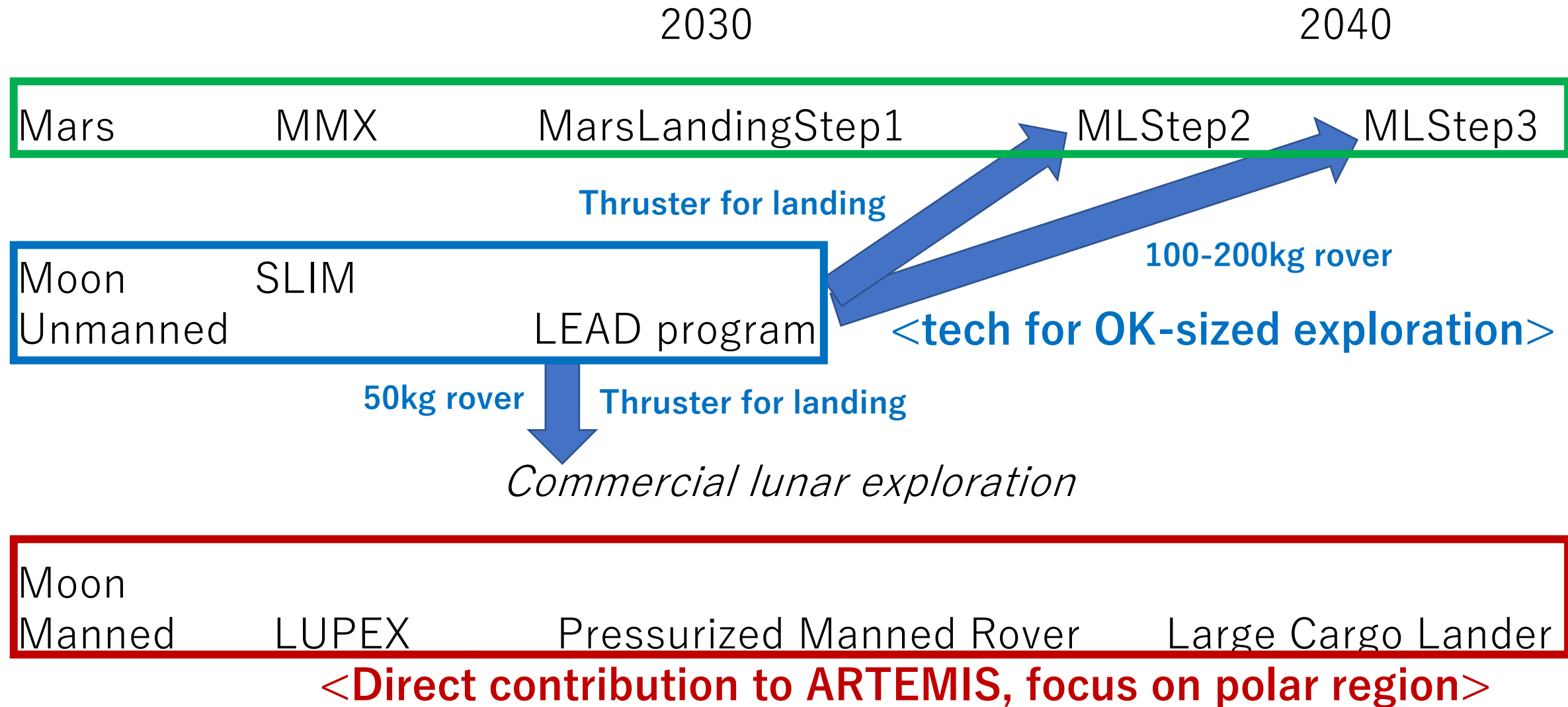
- Tech demo for **OK-sized** lunar exploration
- Driven by top science themes that receive clear merit of being on the surface of the Moon

Radio astronomy

Lunar seismometer network

Sample return

- Precursor to frequent lunar exploration involving multiple assets provided by various parties including commercial sectors which will be deployed in **synergy with human exploration.**



JAXA Mars landing in three steps

Feed to
Deep space
exploration

OTV

Step1 ~2030

Demonstrate safe landing by
an inflatable soft aeroshell

Step2 mid-2030

Size up of aeroshell
Demonstrate pin-point landing to
the Martian surface

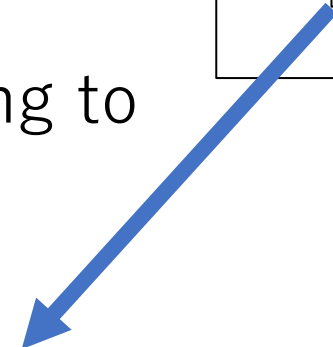
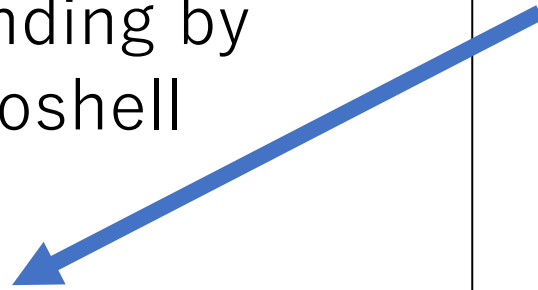
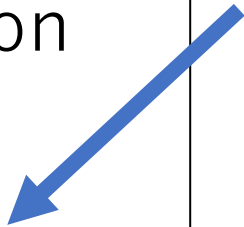
Step3 late-2030/early-2040

Mars Polar Rover

Feed from
lunar exploration
LEAD

thruster

rover



In the Martian **tenuous** atmosphere,
~~heat shield, super sonic parachute~~ and thruster



Inflatable soft aeroshell

*Hard shell is not needed
as long as the mass to be
delivered is not too high.*

Limited launcher capability, limited budget,
interest in more frequent opportunities... Yes, we are
interested in **light-weight access** to the Mars surface.

Take home

- Human exploration division at JAXA taking care of direct contribution to ARTEMIS.
- Scientist-engineer teaming-up under limited launcher capability and budget: **JAXA/ISAS's way**
- We are interested in **light-weight access to the Mars surface.**
- **LEAD** program to develop **OK-sized** assets for surface exploration of the Moon, with Mars as the final target in mind.