
SPACE RESOURCES ROUNDTABLE 2026
Introduction to New Developments in Space Resource Activities in Korea
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Republic of Korea

Korea's Space Exploration Roadmap (Lunar Exploration)

KASA

'25 '30 '35 '40 '45

Lunar Exploration

Securing Core Technologies for Lunar Exploration

Verification of Lunar Orbit Insertion Capabilities

Communication Relay Demonstration

Lunar Lander

Lunar exploration equipment (lunar surface environment, etc.)

Lunar exploration instruments (lunar/space environment, geology, etc.)

Mobility (autonomous driving and other AI applications, etc)

Next-generation launch vehicle

Advancing Lunar Exploration Capabilities and Promoting Commercialization

Lunar lander (industrial applications, logistics and transportation, etc

Strategy 2-1

Lunar exploration equipment (lunar resource verification, infrastructure, etc.)

Movement Skills (Medium/Group)

Lunar infrastructure technologies (communications, power, construction, etc.)

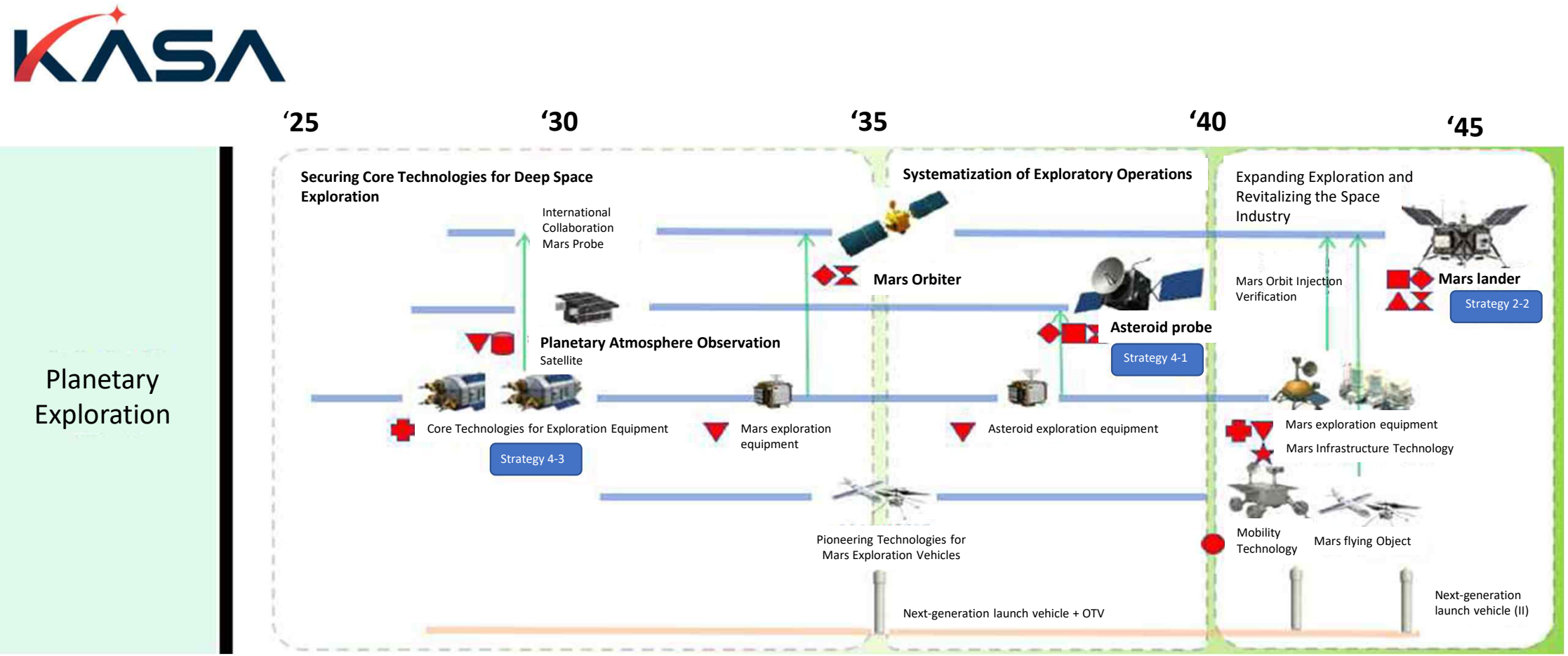
Next-generation launch vehicle + OTV

Establishment of a Lunar Economic Base

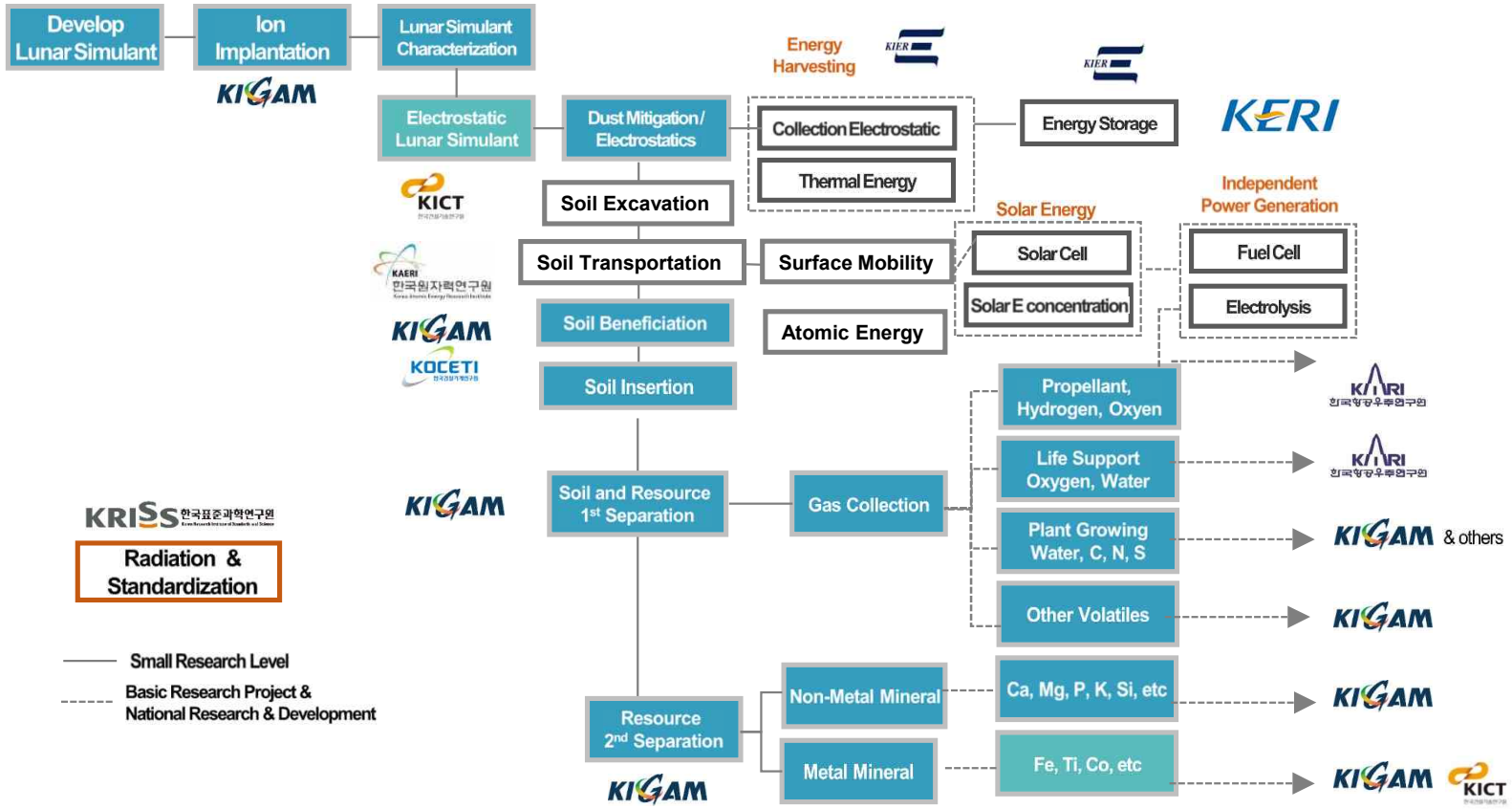
Lunar Economic Base

Strategy 3-2

Korea's Space Exploration Roadmap (Planetary Exploration)



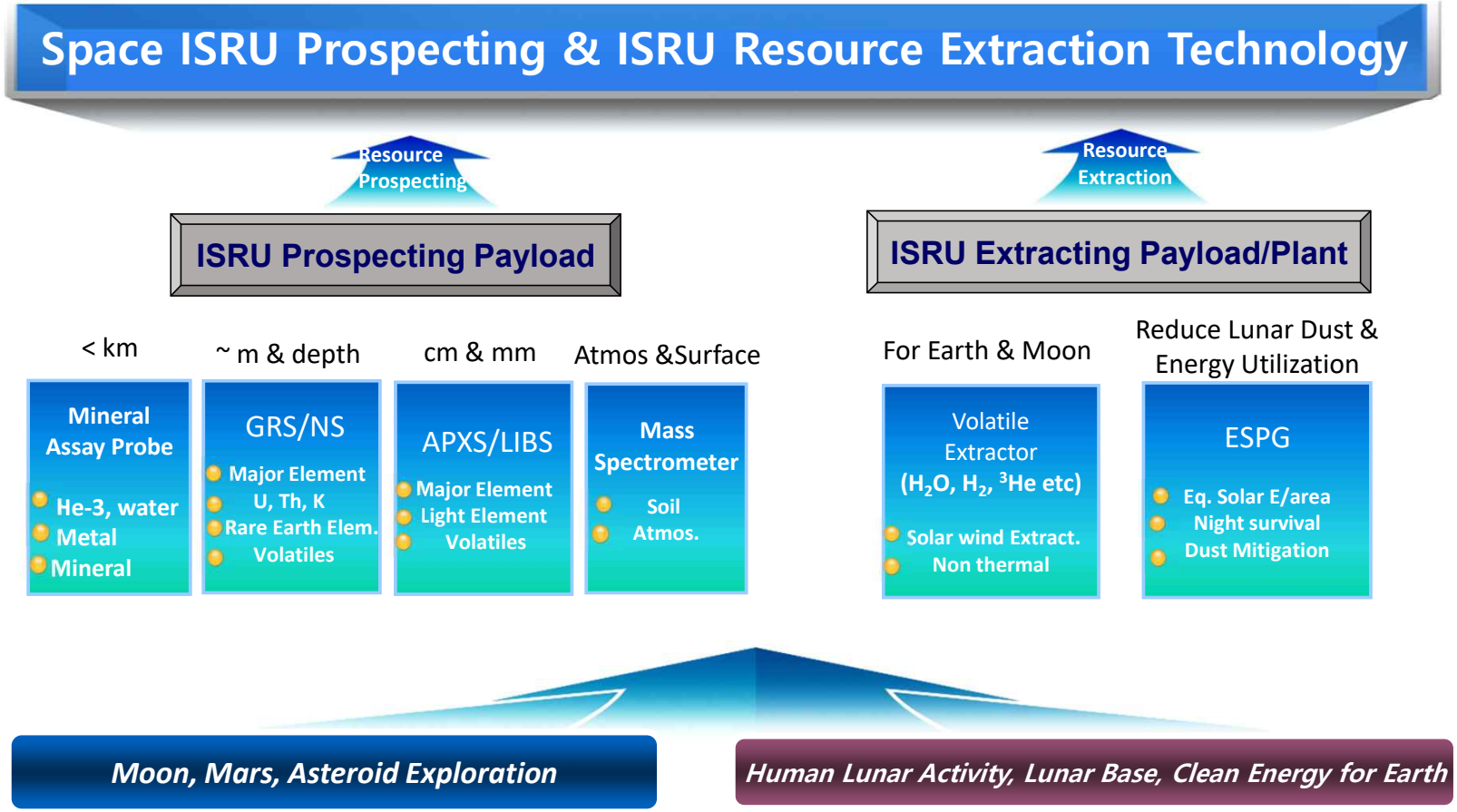
Lunar ISRU Technology Collaboration Network



Research Scope of In-Situ Resource Utilization in Korea

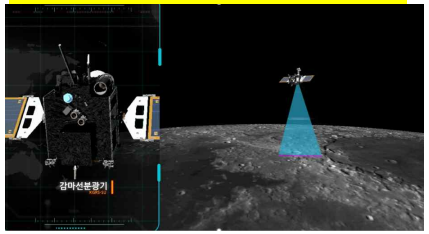
(1) ISRU – Resources : KIGAM, KIER, KERI, KAREI, KRISS, KICT, KOCETI

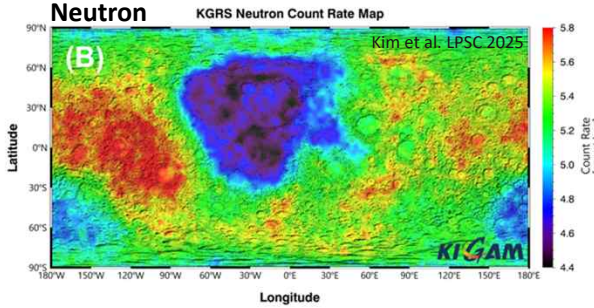
KIGAM's ISRU Research Areas

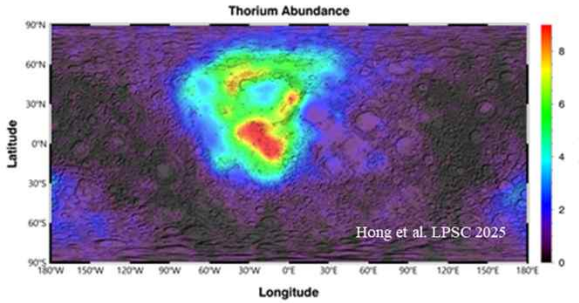


KPLO mission results by KGRS, KIGAM

Contribution to ILRPC !

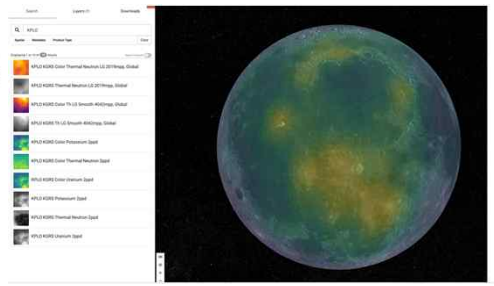




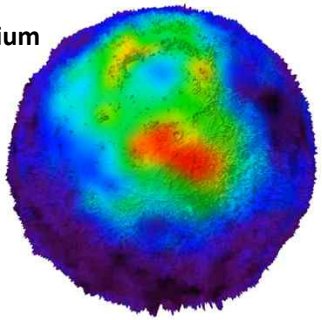


SOLAR SYSTEM **TREKS**

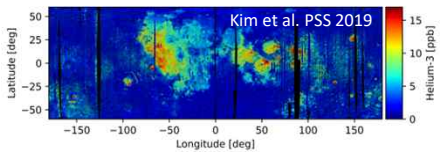
NASA SSERVI MoonTrek

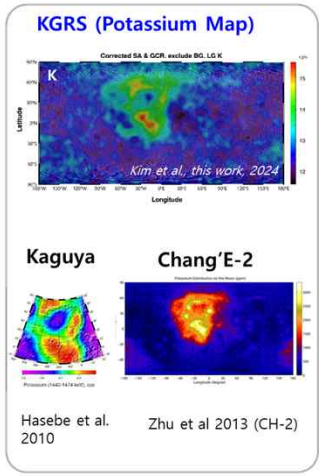


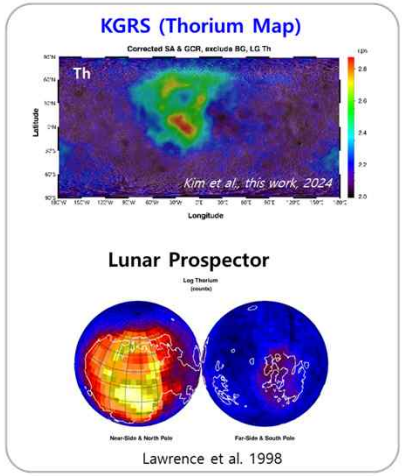
Thorium

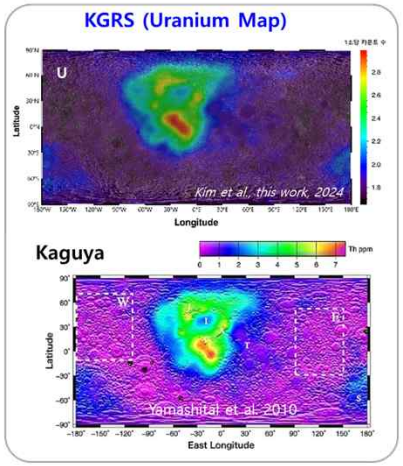


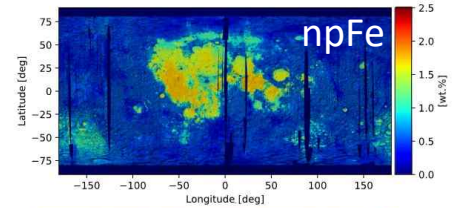
He-3

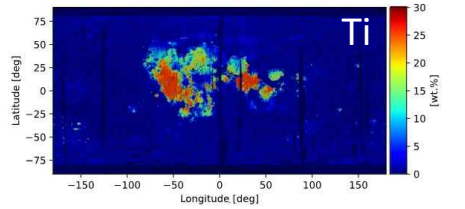










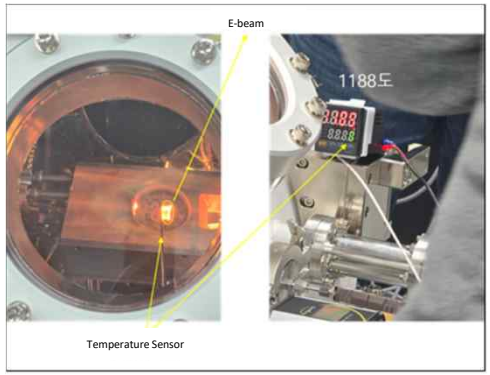


Technology Developments for ISRU at KIGAM

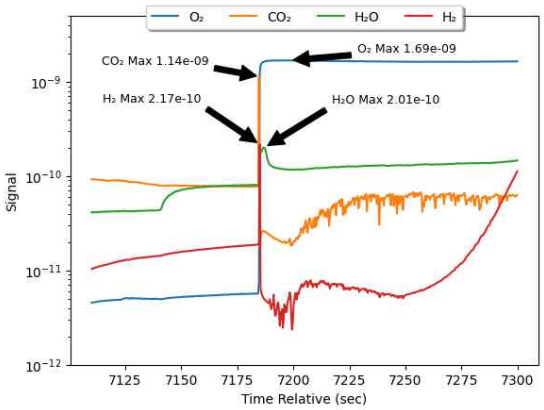
Volatile Extraction System and Preliminary Data

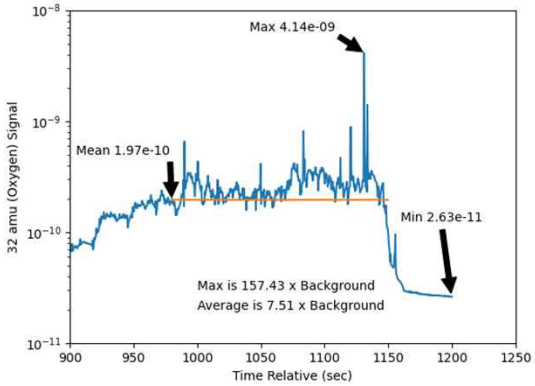
<Soil Heating System>

<E-bam Heating Unit>



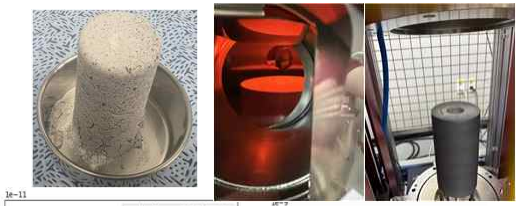
< Soil heating vacuum reactor >

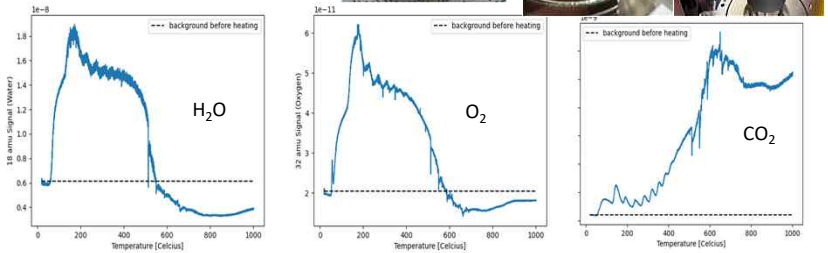




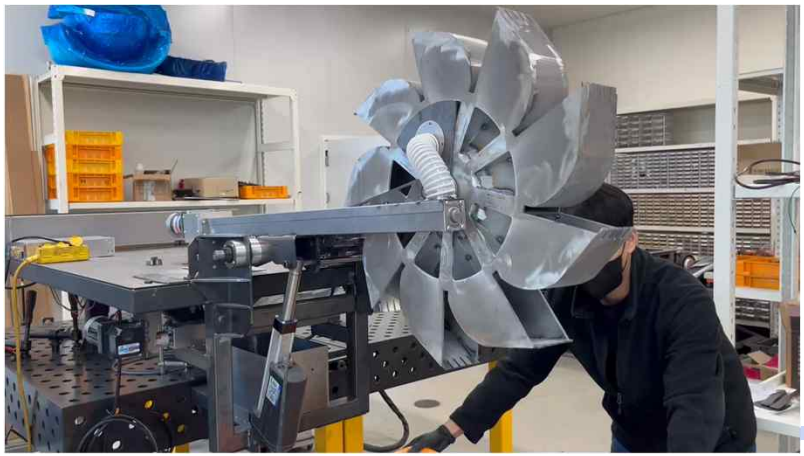
At approximately 1,200 degrees, the mineral structure breaks down and oxygen is released

Gas analysis results based on the temperature of the soil-heated reactor (RGA)





Technology Developments with other organizations

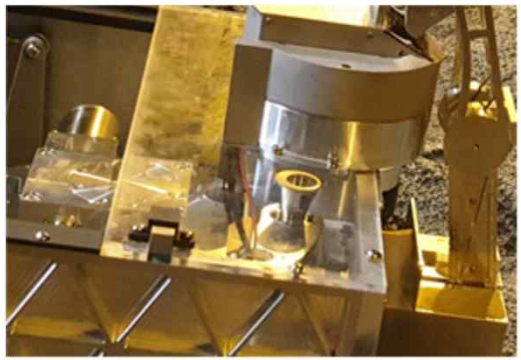


Collaboration with Korea Construction Equipment Technology Institute

- Field Test with ISRU Payload in 2026
- Solar energy production and utilization

Technology Developments for ISRU at KIGAM

GRS, GNS, XRS, LIBS, Gas detector, GPR

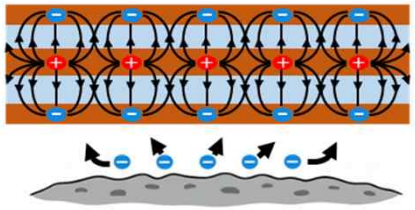


KAIST Dust Mitigation & ESPG

ElectroStatic Power Generation for sustainable lunar surface operations

PROBLEM TO OPPORTUNITY

Charged regolith is both a contamination risk and a recoverable electrostatic resource.



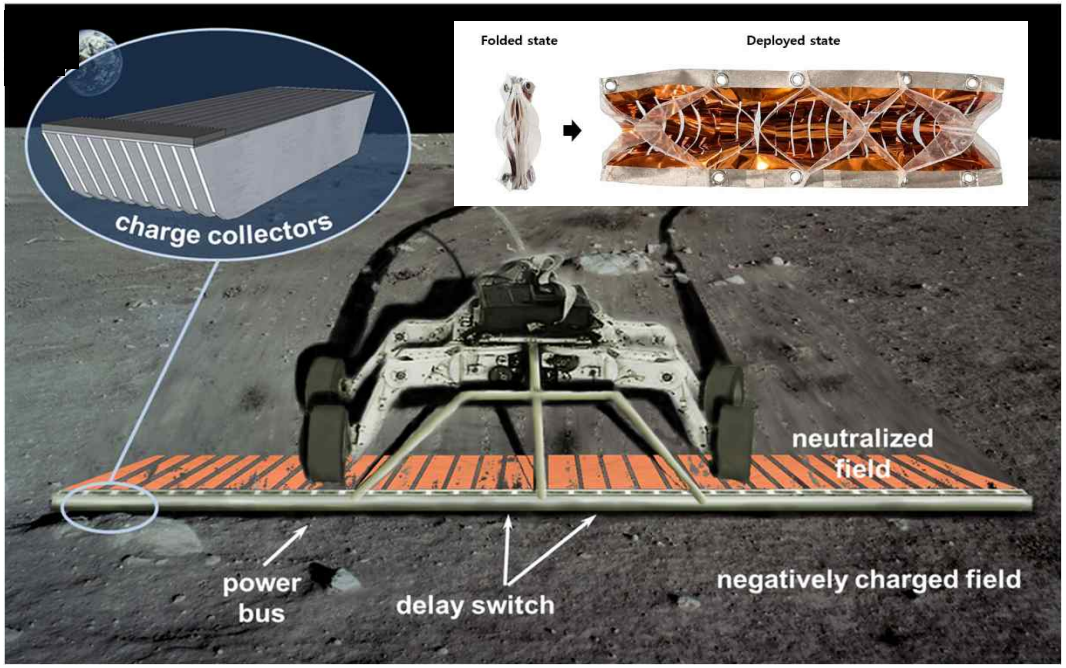
01 Dust mitigation
Reduce charged-particle accumulation on surfaces that must remain functional during lunar operations.

02 Electrostatic harvesting
Collect charge through thin film electrodes and store induced charge across a dielectric layer.

03 Deployable contact area
Use flexible kirigami–scissors structures to increase surface contact with reduced mechanical complexity.

ESPG contact architecture

A surface-contact collector links regolith charge neutralization with power generation and cleaner functional surfaces.



A Charged lunar regolith → **B** ESPG collector → **C** Cleaner surface + power

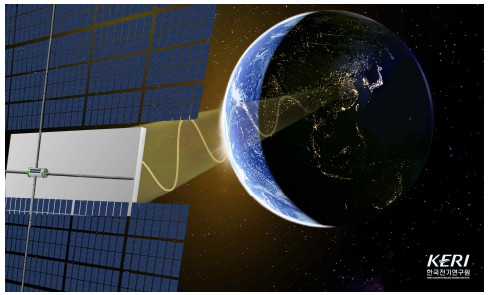
VALIDATION PATH

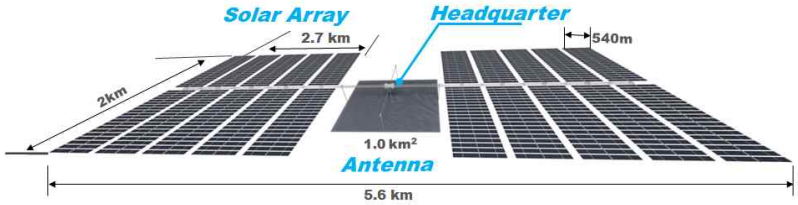
From bench response to lunar-like high vacuum testing

Lunar-like validation near 10^{-6} Torr with e-beam-charged regolith simulant.

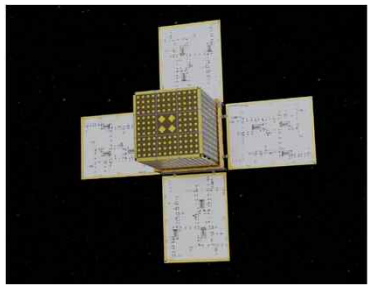
KERI's Research and Development

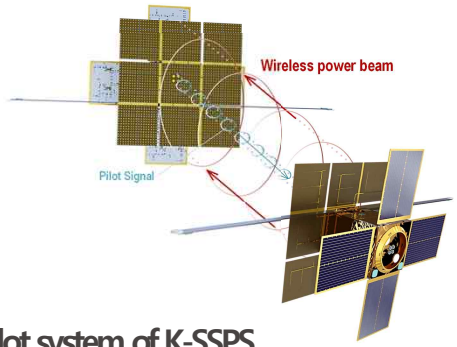
Wireless Power Beaming Tech. for Space Applications



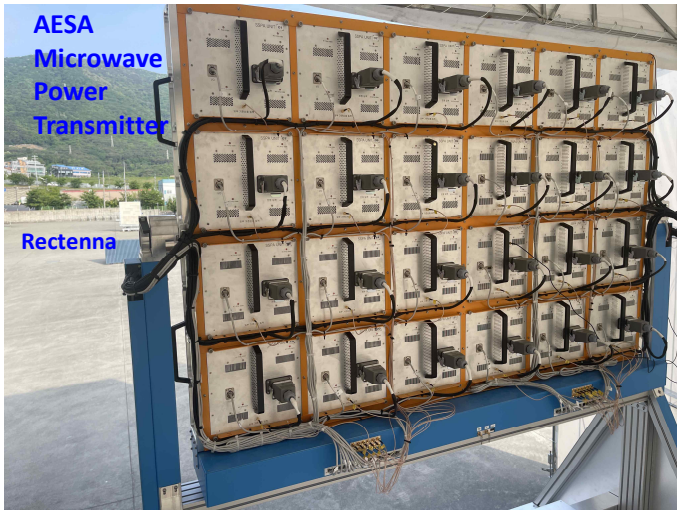


Concept of K-SSPS (Korean Space Solar Power Satellite, '19)

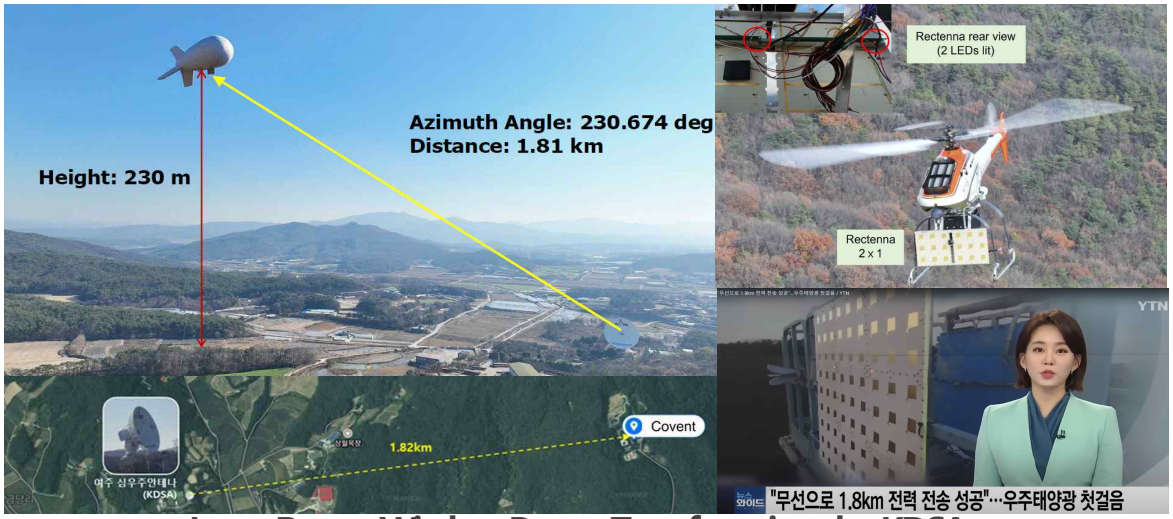




The 1st pilot system of K-SSPS



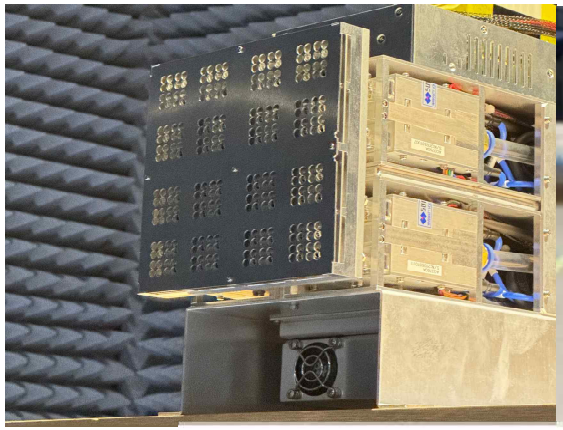
Modular Microwave Power Beaming System

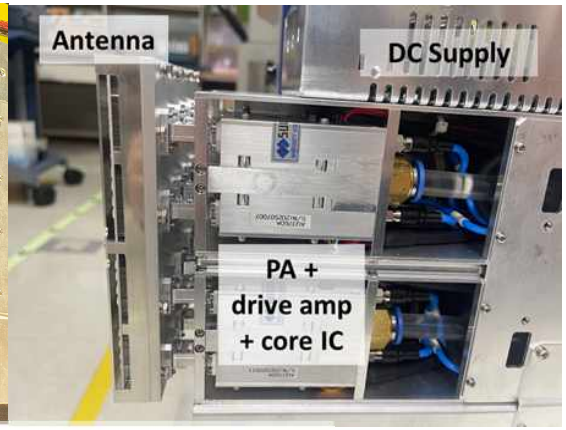


Long-Range Wireless Power Transfer using the KDSA
(Korean Deep Space Antenna for Lunar-orbiter Control)

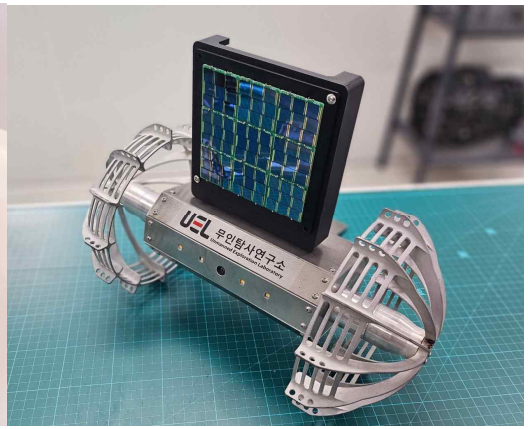
KERI's Research and Development

Wireless Power Beaming Tech. for Space Applications

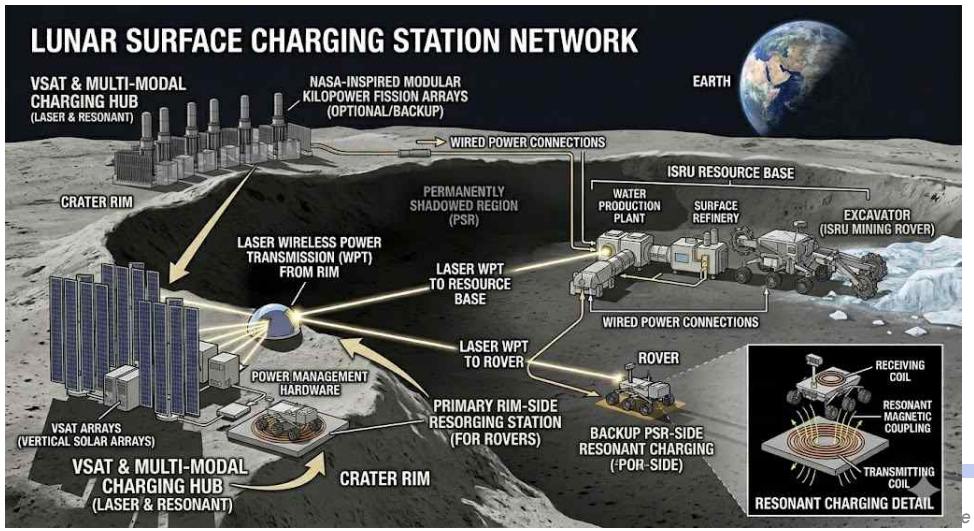


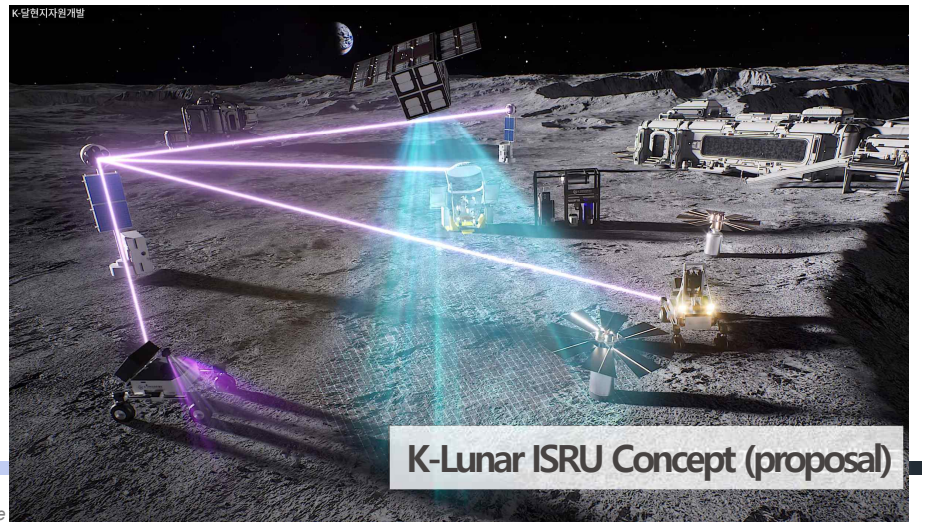


Millimeter-wave Power Beaming System



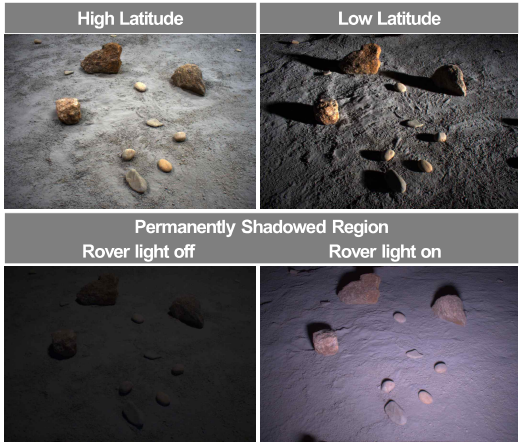
Optical(Laser) Power Beaming System





KICT's Research and Development

Low-light Topographic Mapping



Microwave Lunar Soil Sintering Blocks

Sintering Temperature (℃)	1100
Bulk density (g/cm³)	2.14
True density (g/cm³)	3.04
Total porosity (%)	29.76
UCS (MPa)	34.20

Drilling & Geotechnical Information

	ICE	KLS-1 + ICE	SAND + ICE
UCS	4 MPa	10 MPa	12 MPa
Drilling Test			

Lunar Surface Environment Facility

Dirty Thermal Vacuum Chamber (DTVC)	
Volume	4 m (W) × 4 m (H) × 4 m (L)
Pressure	1×10^{-6} mbar (Empty) 1×10^{-4} mbar (with Soil)
Temperature	-190℃ (liquid nitrogen, LN_2) +150℃ (Halogen Lamp)
Soil Container	3.0 m (W) × 3.0 m (L) × 0.5 m (H) 10 tons, Tiling 0~30 deg.

KASI's Payload(LUSEM) for CP-11 Science

https://pda.kasi.re.kr/mission-clps.php

The Moon Base III landing will also deliver payloads from ESA and KASI, demonstrating that the future of lunar exploration is an international effort. - May 26, 2026, Jared Issacman -

UEL's Research and Development

System Verification Roadmap

Space Graded Component using Nuri Program in KASA

Components

- CAM/IMU/Motor/Communication
- CAN/RS422/RS485
- Oriented rover OBC/ESC

Nuri 4th

COSMIC

- Launch Time: 25. Nov.
- 3U / 3.9kg
- OBC / ESC Verification

Nuri 5th

UEL-Y-Sys

- Launch Time: 26. Aug.
- 6U / 12kg
- Unified OBC + CAM/IF Verification

Lunar Landing

Lander Selfie Rover

- Launch Time: 2027~
- Real Tech. Mission
- Space Heritage

Scarab

Payload: 200g

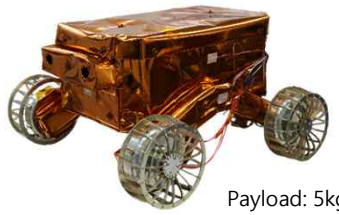
- ✓ Under 2kg (net. Weight)
- ✓ Swarm work communication
- ✓ Resource Exploration
- ✓ Free Drop Deployment

Deployable 2-Wheel

Payload: 1kg

- ✓ Lava Tube Exploration (with KAIST)

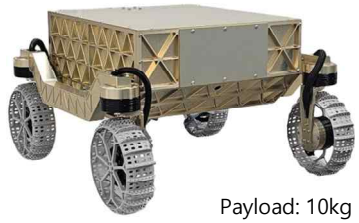
Haetae Ⅱ



Payload: 5kg

- ✓ Korea Exploration Model (KARI & KIST)
- ✓ TVAC Test and Analysis

Ankylo



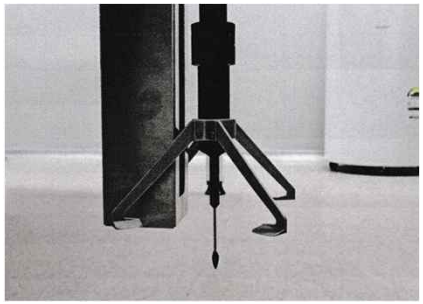
Payload: 10kg

- ✓ Standardization for pay loading
- ✓ Long distance mission

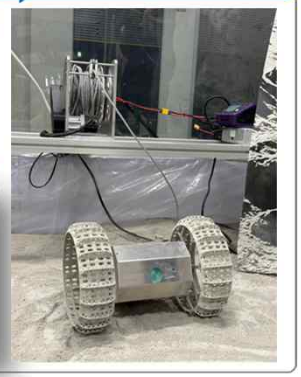
UEL's Research Collaboration with Government Institutes

KIGAM



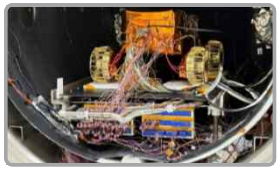

KAI

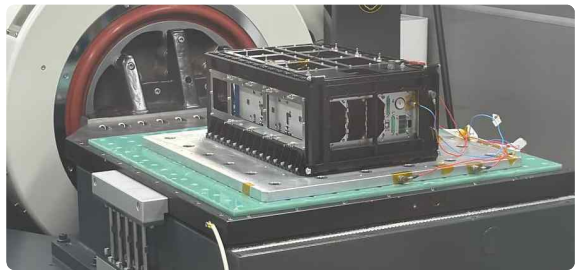

ISU

KARI





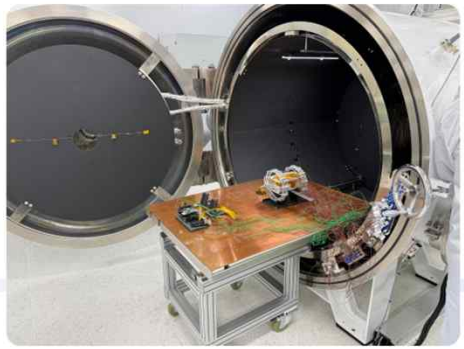
Nuri 5th Cube Sat UEL-Y-Sys.



Field Test



KERI

KICT

Workshop in Korea Related to Space Resources

- 1. July 2 ISRU Workshop
- 2. The 4th International Workshop on Space Resource and Exploration

Korea Society for Space Resource & Energy