Nuriho4Tea launcher

Press kit(Press Kit)

November 2025

Space Agency

Korea Aerospace Research Institute

index

1 Launch Overview

□ Launch vehicle / Performing agency: Nuri / Korea Aerospace Research Institute (KARI)

□ purpose

blanketNuriho, manufactured by a system integration company based on Nuriho technology transfer4Opportunity

Enhance the reliability of Nuriho by utilizing it to launch medium-sized satellites and cube satellites, and foster the domestic private space industry ecosystem.

□ Location: Naro Space Center (Haban-ro, Bongrae-myeon, Goheung-gun, Jeollanam-do)508)

○ Tokyo-○ Gyeonggi ○127.53degree, north latitude34.43do

□ Scheduled date

○ Feet buy Yeah, yeah : 2025year11month27Sun (Thurs),(※Launch preparation period :11month27Day~12month4Day)

○ Feet buy Sa Kyung dong: (KST) 00:54 ~ 01:14,(※ (GMT) D-1, 15:54 ~ 16:14))

※The launch time is**Weather conditions on the day of launch,**orbiting the universe**Collision with space objects**Enough**Cannot be avoided**

Available time zone Considering the back **The final decision will be made by the Launch Management Committee on the day of launch.**

□ 4Car-launched satellite:**Next-generation medium-sized satellite3like**(1Ki) +**CubeSat**(12energy)

blanketNext-generation medium-sized satellite3Ho (Development Manager: Korea Aerospace Industries)

blanketCubeSat (Developed by: Korea Aerospace Research Institute, Spacelintec, Hancom InSpace, Electronics and Telecommunications Research Institute, Woozoo Tech, Cosmoworks (2(gi), quaternion, Seoul National University, Inha University, KAIST,Sejong University)

curiosity	Launch date	Onboard satellite	note
FM1	2021year10month21Day	1.5ton-class satellite replicator	Orbital insertion failure
FM2	2022year06month21Day	Performance verification satellite (PVSAT) + 1.3ton-class satellite replicator	Successful test launch (successful development)
FM3	2023year05month25Day	Next-generation small satellites2like + CubeSat7energy	successful launch (First mission)

<Note: Nuriho launch record >

2 Nuriho3Tea launch and4Tea launch difference

☐ Medium-sized satellite launch service

blanketNuriho4In the car launch, it is a medium-sized satellite.**Next-generation medium-sized satellite3Ho launch**

☐ The system integration company is in charge of the entire process of producing the launch vehicle.

blanket4In the car launch, a private system integration company (Hanwha Aerospace) transferred technology.

The company will oversee the production of the launch vehicle, and Hangwooyeon will take over and carry out the launch operation.

- Nuriho4Hogi is a system integration company that manages the component participating companies, from single assembly to full body assembly.**The first launch vehicle to be built throughout its entire lifespan**

※Hangwooyeon is**4Car launch**In charge of the launch operation**System integration companies are participatory**It consists of,

In subsequent launches**We plan to gradually expand the scope of participation of system integration companies.**

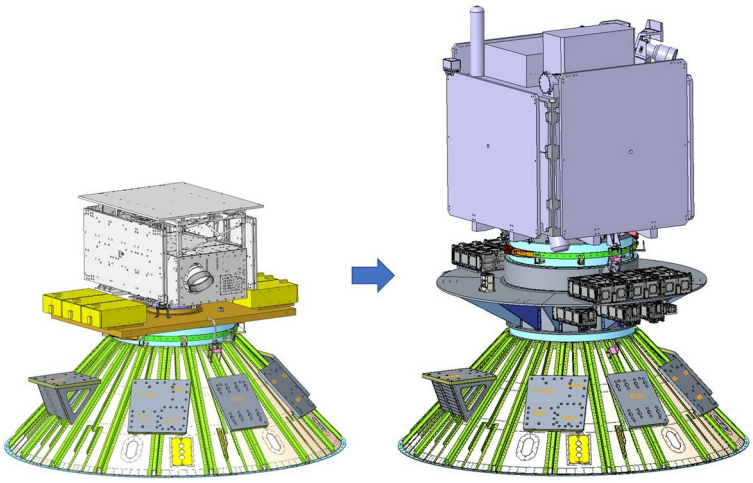
Nuriho3Tea launch and4Car launch comparison>

division		Nuriho4car ('25.11.27.)	Nuriho3car ('23.5.25.)
Launch time		**00:54 ~ 01:14**	18:24
Target altitude		**600 km**	550 km
orbit		**Sun-synchronous orbit**	Dawn-Dusk Sun-Synchrotron Orbit
slope angle		97.79°	97.59°
satellite	Mount satellite	▸ ((Main satellite)**Next-generation medium-sized satellite3like** ▸ ((Sub-satellite) Manufactured by domestic companies, universities, and research institutes **CubeSat12energy**	▸ ((Main payload satellite) Next-generation small satellite2like ▸ ((Sub-satellite) Toyosat (4(Gi), Lumir, Justec, Kairospac, etc.7energy
	Satellite weight	**approximately960 kg** ▸ Next-generation medium-sized satellite3Ho, medicine516 kg ▸ Sub-satellite12Ki, medicine79 kg ▸ Satellite launch device and adapter, approx.365 kg	approximately500 kg ▸ Next-generation small satellites2like,180 kg ▸ Sub-satellite7energy,60 kg ▸ Satellite launch device and adapter,260 kg
	satellite separation	▸ take-off807Disaggregation of super-post-mounted satellites ▸ approximately20In seconds, all at once2Separation of the satellite from the satellite payload	▸ take-off783Disaggregation of super-post-mounted satellites ▸ 20In seconds7Sequential separation of satellites onboard the launch vehicle
Lead research institute		Hangwooyeon (produced by Hanwha Aerospace)	Hangwooyeon

☐ 3Major design changes in preparation for the launch of the vehicle

blanket**Multi-Satellite Adapter(MPA, Multiple Payload Adapter)**Development and Application

- Existing adapter(PLA, Payload Adapter)is the main satellite1The ability to carry deception, the need to improve the expandability and flexibility of satellite-mounted systems
- Development of a new adapter that optimizes satellite mounting space to meet diverse satellite mounting requirements.

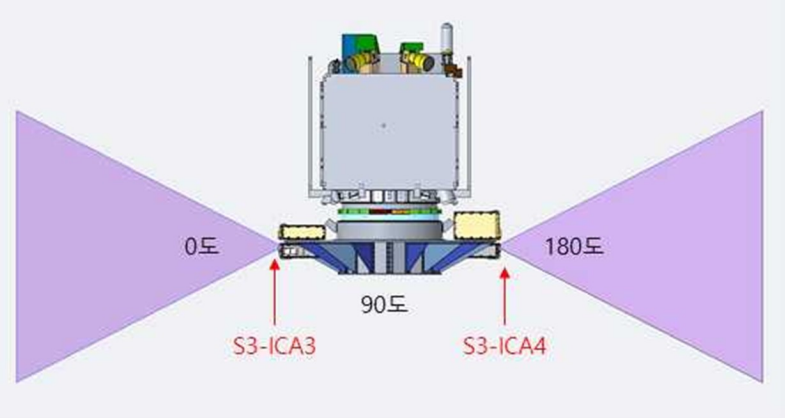


blanket**Top internal camera2Add a key**

- 3In the launch of the car, the CubeSat camera angle is limited.1Ki (Toyo Saet)3(of curiosity)

  Needs improvement as it is impossible to confirm injection status through video

- An internal camera on top to check whether the satellite is launched and its behavior after launch2Add a key



blanketTo reduce satellite onboard noise3stepVent Deviceto**noise reduction**

New cowl development and application

3 Launch propulsion system

☐ Space and Aerospace Administration: Launch permit, management/supervision

blanketLaunch readiness check·Management, launch authorization, launch management·Director, Launch Management Committee and Operation of safety control council, etc.

☐ Hangwooyeon: Project management and launch operation management

blanket foot Foot-kyung foot buy and like-Overall performance of technology transfer work, etc.

blanketGuidance and supervision of the production of Nuriho by the integrated system enterprise

○ ○ ○ ○ ○ ○ ○ ○ ○ (1~3(Same as car launch)

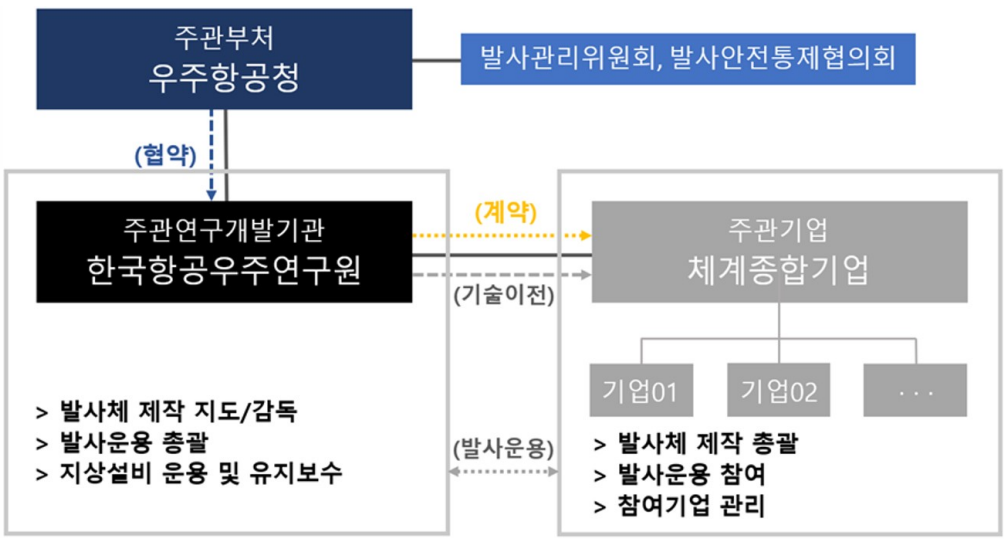
☐ Hanwha Aerospace: Leading the production of launch vehicles and participating in launch operations.

blanket ((launch vehicle production) Nuriho4Oversees overall production of the equipment and manages the quality of partner companies·supervision

※Nuriho1~3In the case of curiosity, Hangwooyeon is in charge of production

blanket (Launch Operations) Launch Command Center (MDC),Launch Control Center (LCC)participation

<Diagram of the relationship between launch-related organizations >



< 1~3car,4Comparison of the manufacturing, assembly, and launch operation of a rocket launcher >

division	1~3Car launch		4Car launch	
	subjectivity	participation	subjectivity	Participation / Management and Supervision
Projectile manufacturing	Hangwooyeon	Participating companies	System integration company	Hangwooyeon (management and supervision) Participating companies (participating)
Total assembly	Hangwooyeon	Participating companies	System integration company	Hangwooyeon (management and supervision) Participating companies (participating)
Launch operation	Hangwooyeon	System integration company* (limited)	Hangwooyeon	System integration company (3(Zoom in on the car)

* System integration company3Participation from the launch stage to assembly

<Scope of work of launch-related organizations >

Institution	Scope of work	produce	test	firing Operation
Aerospace Administration	- Space launch vehicle launch permit - Nuri launch management/supervision - Cooperation between government agencies related to launch - Launch Management Committee, Launch Safety Control Council Operation	-	-	-
Hangwooyeon (Main research institute)	Comprehensive performance of tasks such as repeated launches and technology transfer	management supervision	subjectivity	subjectivity
System integration company (Host company)	Transfer of technology for production and launch to Hangwooyeon Joint work	subjectivity	participation	participation

blanketTransferring Nuriho technology, developed independently in Korea, to a private system integration company

Strengthening industrial ecosystem capabilities

- System integration company Nuriho4~6Participating in the launch operation of the car, acquiring technology to carry out the follow-up launch of Nuriho under private leadership after the completion of the advanced project.

4 Onboard satellite

☐ Main payload satellite: Next-generation medium-sized satellite3like(CAS500-3)

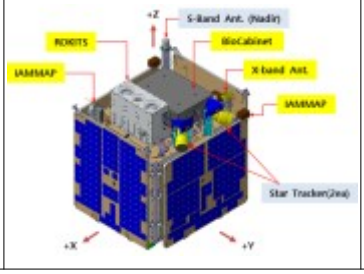
blanketDevelopment Agency: Korea Aerospace Industries (KAI)

blanketsatellite mission

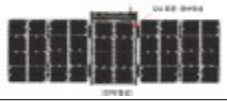
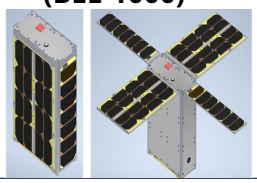
- Space science research and space technology verification

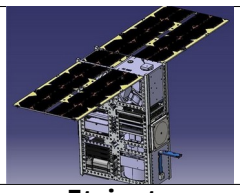
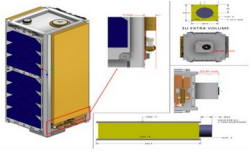
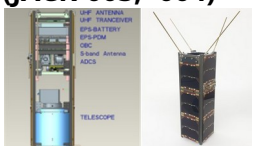
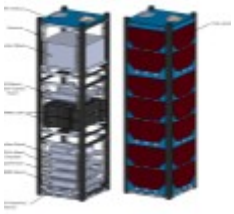
※ ①Bio cabinet (3D(Verification of bioprinting and stem cell technology)② IAMMAP(Cosmic magnetic field/ plasma measurement),③ ROKITS(Earth's aurora/atmospheric observation)

blanket**Satellite specifications**

Development agency	Satellite name	System
Korea Aerospace Industries (KAI)	**Next-generation medium-sized satellite3like (CAS500-3)** 	- Mission Life:1More than years - Altitude:600 km (Sun-synchronous orbit) - size (mm) : ∅1924 mm x 1764 mm (launch state) - Weight: approx.516 kg - Power consumption:1.1 kW - communication :S-Band (Remote meter reading & command) - reception:X-Band (Observation data reception) - Payload: Biocabinet,IAMMAP, ROKITS

☐ Sub-satellite: CubeSat (12energy)

Development agency	Satellite name	Mission and payload	System
Hangwooyeon	**Domestically produced components Space Verification Support Platform 1like (E3_TESTER_KARI-1)** 	- Mission: Support for space verification of domestically produced components - Payload:8UMedical oxygen device·Consists of a component payload.3doggy The company divides the space Allocated	- Mission Life:6months~1year - Altitude:600 km - Size/Weight:12U/20.4kg - Power consumption:20 Wbelow - communication :S-band, X-band
Space Lintech	**lowliness (BEE-1000)** 	- Mission: Space demonstration of a protein crystal growth platform in low Earth orbit. (protein crystal growth, etc.) - Payload:BEE-PC1 (Protein crystal growth module)	- Mission Life:6months - Altitude:600 km - Size/Weight:6U / 11.8 kg - Power consumption: ~34.4 W - communication :UHF, S-Band
Hancom Inc. Space	**Sejong4like (SEJONG-4)**	- Mission: Earth observation and imaging, securing own satellite technology. Public Multispectral imaging for utilization filming	- Altitude:600 km - Size/Weight:6U / 7.4 kg - Power consumption: ~20 W - communication :S-Band, X-Band

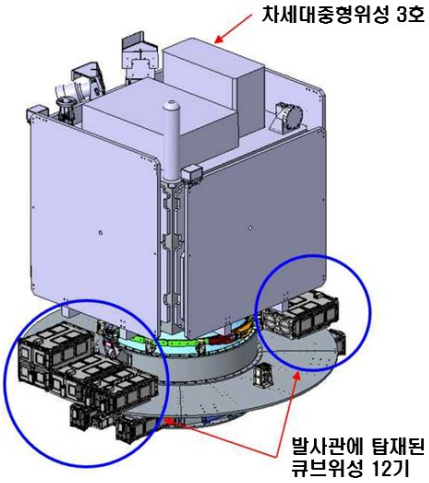
		- Payload:Multi-Spectral EO Camera, 8 Bands	
Electronic Communications (Korea)	**Etrisat (ETRISat)** 	- Mission: Low-Earth Orbit Microsatellite for Ocean Climate Prediction Services Based onIoTData Telecommunications services - Payload:IoTCommunication payload	- Size/Weight:6U / 9.2 kg - Power consumption:43.8 W - Mission Yong (IoT) : Frequency 915~916.5 MHz - Ground station: Telecommunications (Yeon) to be installed
Spacerotech	**Cosmic (COSMIC)** 	- Mission: Satellite mission and subsequent disposal (PMD)Device space verification, space exploration use rover Motor Driver Space Verification - Payload: (Payload1)Post-mission disposal device (PMD). (Payload2) Lunar Exploration Rover Actuator, Drivers and how to operate them Onboard computer for	- Size/Weight:3U / 5.1 kg - Power consumption:10 W - communication :UHF, S-Band
Cosmo Works	**jack-003, –004 (JACK-003, -004)** 	- Mission: To manufacture and operate its own satellites through orbital operations. Verification of technology and onboard chain Data using optical systems Obtain Earth observation images by receiving - Payload:GSD5mSatellite optical system with high resolution (EO - Telescope)	- Size/Weight:3U / 3.8 kg - Power consumption: ~5 W
Quaternion	**Faucet01 (PERSAT01)** 	- Mission: Monitoring ocean currents of marine debris off Jeju Island, domestic production of Cube Satellite components verification - Payload: Satellite camera module, Iridium communication module	- Mission Life:6months - Altitude:600 km - Size/Weight:3U / 3.3 kg - Power consumption: ~3.74 W - communication :UHF,Iridium Communications
Seoul National University	**Snooglet3 (SNUGLITE-III)** 	- Mission:3DEarth's atmosphere observations (GPS RO)Cube Satellite Formation flight and rendezvous-docking - Payload: For low orbitGPSReceiver, satellite-to-satellite communication module, docking interface	- Mission Life:1year - Altitude:600 km - Size/Weight:3U2energy/7.0kg - Power consumption: each3.51 W - communication :UHF, S-Band
Inha University	**Inha Roseat (INHA-RoSAT)** 	- Mission: Verify the space environment operability of rollable solar cell modules. Accumulation of operational data, self-design OBCSpace operability Verification and design of space-grade components/ Production capability verification - Payload: Rollable solar cell	- Mission Life:6months - Altitude:600 km - Size/Weight:3U / 4 kg - Power consumption:14.1 W - communication :UHF, S-Band

		module,Rollable Solar Array Drum AssemblyMount	
KAIST	**K-Hero (K-HERO)** 	- Mission: For microsatellites Orbital verification of the Hall thruster and Space environment normal operation verification - Payload:50WSudden hole thruster system	- Mission Life:6months - Altitude:600 km - Size/Weight:3U / 4.2 kg - Power consumption:4 W - communication :UHF
Sejong University	**Spyron (SPIRONE)** 	- Mission: (IRcamera array)IR Marine plastics in the ocean Check the observability. (LEO Navigation signal generator) Micro-satellite BaseLEONavigation signal generator Development and Verification - Payload: For scientific missionsIR Camera, for technical missionsLEO Navigation signal generator	- Mission Life:1year - Altitude:600 km - Size/Weight:2U / 2.2 kg - communication :S-Band

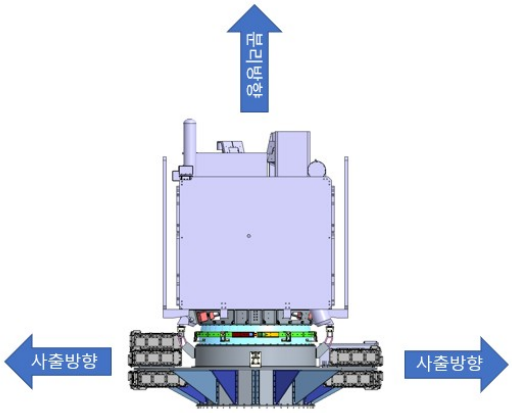
☐ Satellite loading plan and launch plan

blanketNext-generation medium-sized satellite3The lake uses a satellite separation device to connect to a multi-satellite adapter.

Equipped, the CubeSats are mounted on individual launch tubes



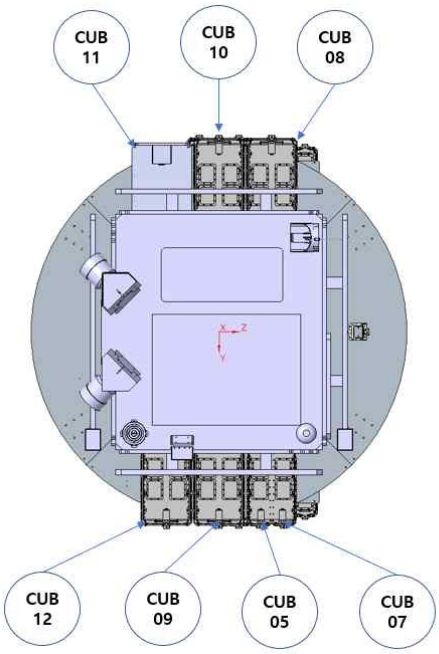
Nuriho4Satellite launch vehicle payload shape>



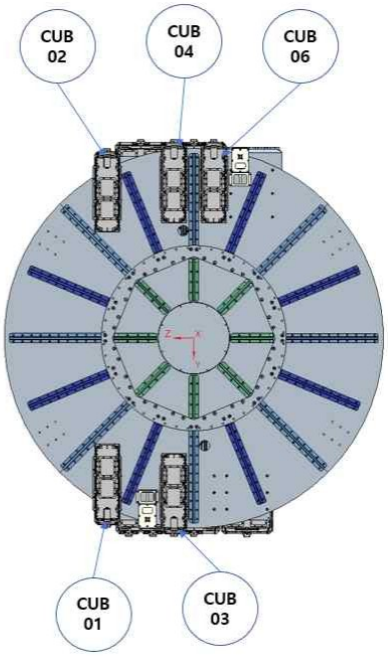
<Satellite separation and launch direction>

blanketprojectile3When the stage reaches the target altitude, the next-generation medium-sized satellite3Hoga first

Separated, and then about20CubeSats at one time at intervals of seconds2Injection by ki



<Cube Satellite Location (Air Surface)>



<Cube Satellite Location (bottom)>

<Reference: CubeSat Launch Sequence>

Injection order **west**	number	satellite agency	Satellite name	satellite **size**
1	CUB01	Sejong University	SPIRONE	2U
	CUB02	Quaternion	PERSAT01	3U
2	CUB03	Spacerotech	COSMIC	3U
	CUB04	Cosmo Works	JACK-003	3U
3	CUB05	Cosmo Works	JACK-004	3U
	CUB06	Inha University	INHA-RoSAT	3U
4	CUB07	KAIST	K-HERO	3U
	CUB08	Hancom InSpace	SEJONG-4	6U
5	CUB09	Seoul National University	SNUGLITE-III	6U
	CUB10	Space Lintech	BEE-1000	6U
6	CUB11	Electronics and Telecommunications Research Institute	ETRISat	6U
	CUB12	Korea Aerospace Research Institute	E3_TESTER_KARI-1	12U

5 Detailed launch operation schedule

※Nuriho4In the case of a car launch, considering launching at dawn, the launch vehicle has been transported and the launcher has been installed.

Up to that pointD-1,From the next day until the launch is completedD-DayDefined as

【D-1】Launch Preparation: Launch Vehicle Transport and Launch Vehicle Standing/Inspection

	Major operational events
【D-1】	- **Using a transporter at the missile assembly building,2Transfer to the launch pad** - **Erector*Using the projectile stand** * Erector(Erector) :Performs attitude control function to erect the fully assembled Nuriho on the launch pad - **Check the umbilical connection for pairing air conditioning, electrical umbilical and connection status** - **Fuel/oxidizer umbilical hydraulic line connection and leak test** - **Launch vehicle function check (avionics, etc.)**

【D-Day】Launch Operation: Checking for propellant filling and filling with helium

	Major operational events
【D-Day】	- **Final inspection of launch operations** - **Launch vehicle avionics external power authorization and inspection** - **Initial condition inspection of launch pad hydraulic and pneumatic equipment** - **Inspection completed for propellant and helium charging** - **Start of helium charging and replenishment for valve and engine control** - **Ready for liquid oxygen and kerosene charging** - **Propellant chargeGo/No-godecision**

【D-Day】Launch Operation: Propellant Charging and Standing Device Withdrawal

	Major operational events
【D-Day】	- Liquid oxygen supply line and tank cooling (launch agent)4(time ago)
	- Kerosene and liquid oxygen charging - Helium filling for pressurizing propellant tanks
	- Withdrawal of the launch vehicle erection device - Inertial navigation guidance system alignment begins
	- Launch vehicle erection device withdrawal completed - **firingGo/No-godecision**

【foot buy 101 minute ago] Automatic launch operation (PLO)

	Major operational events
【D-Day】	- Launch automatic operation start (launch10minutes ago) ※Automatic launch operation (PLO: Pre-launch Operation) :firing10Launch vehicle liftoff from the moment of launch eve Launch preparation work performed automatically by the launch control system
	- Projectile ready for launch
	- 1Single engine thrust300Tone Reach and Unlock Command
	- Launch vehicle liftoff and umbilical plate separation

6 Flight sequence

☐ Flight sequence

blanketNuri, launched from Naro Space Center, took off after1Single and2step For flight safety in the thrust section**170°Launch azimuth of**Follow **south**Fly to

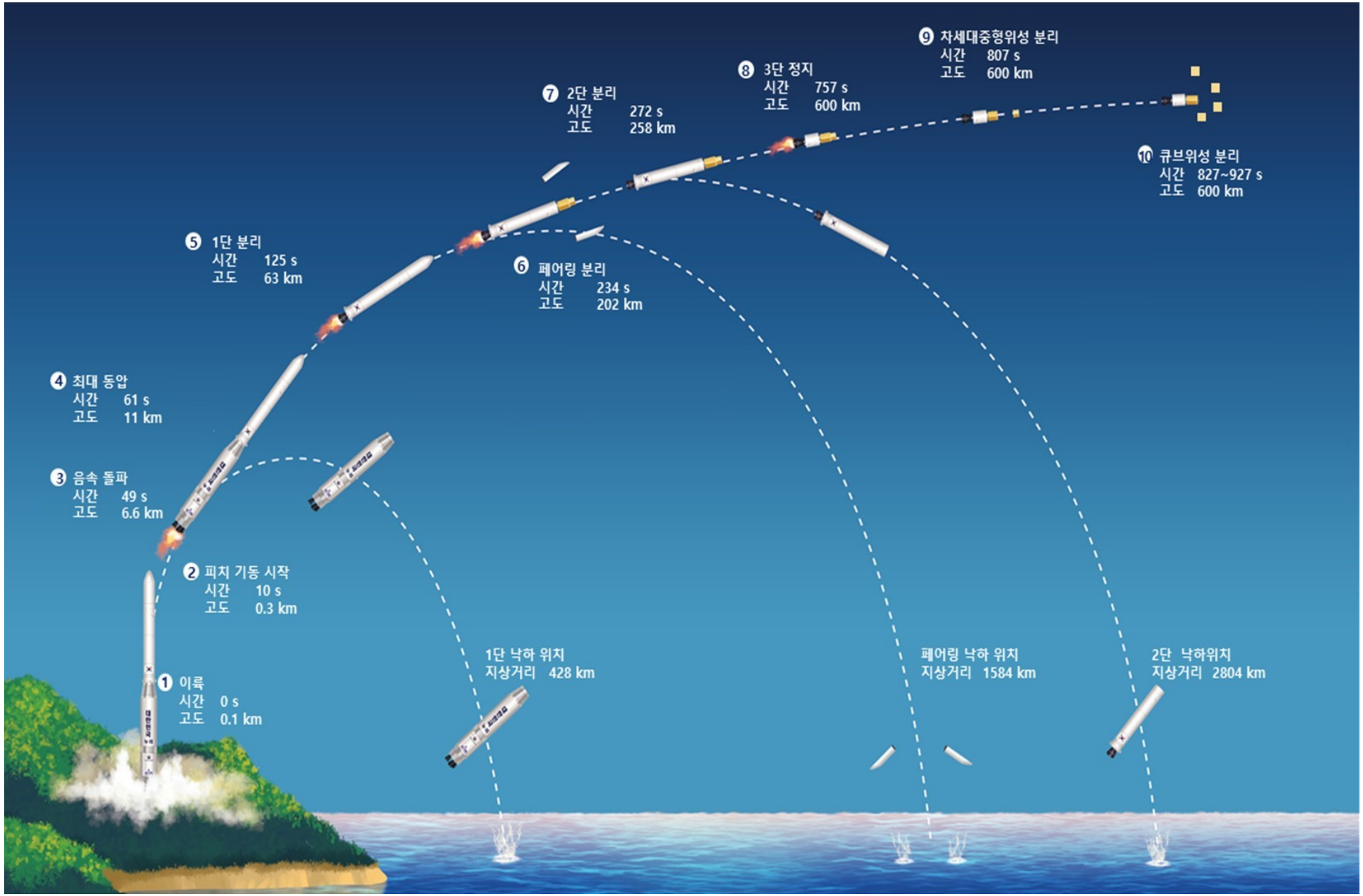
blanket**Nuriho1/2Single separation**→**Pairing separation**→2/3**Single separation**→**Next-generation medium-sized satellite3like separation**→**Sub-satellite12separation of air**

- 1However, pairing,2The expected landing points of the missiles are approximately 100m from the launch site.430 km,approximately 1,585 km,approximately2,804 kmPredicted to fall into the open sea

Nuriho4Car launch flight sequence>

situation	Launch criteria (L+,candle)	altitude (km)	Flight event
Nuriho4car firing	-	0.1	take-off
	125	63.4	1Single separation
	234	201.9	Pairing separation
	272	257.8	2Single separation
	807	600.2	satellite1Car separation (next-generation medium-sized satellite)3like)
	827	600.1	satellite2Car separation (Cube Satellite)1&2)
	847	600.1	satellite3Car separation (Cube Satellite)3&4)
	870	600.0	satellite4Car separation (Cube Satellite)5&6)
	889	600.0	satellite5Car separation (Cube Satellite)7&8)
	907	599.9	satellite6Car separation (Cube Satellite)9&10)
	927	599.9	satellite7Car separation (Cube Satellite)11&12)
	1,284	602.0	Flight ended

※The above launch sequence may change depending on the launch environment on the day of launch.


❶ 이륙
시간 0 s
고도 0.1 km
❷ 피치 기동 시작
시간 10 s
고도 0.3 km
❸ 음속 돌파
시간 49 s
고도 6.6 km
❹ 최대 동압
시간 61 s
고도 11 km
❺ 1단 분리
시간 125 s
고도 63 km
❻ 페어링 분리
시간 234 s
고도 202 km
❼ 2단 분리
시간 272 s
고도 258 km
❽ 3단 정지
시간 757 s
고도 600 km
❾ 차세대중형위성 분리
시간 807 s
고도 600 km
❿ 큐브위성 분리
시간 827~927 s
고도 600 km
1단 낙하 위치
지상거리 428 km
페어링 낙하 위치
지상거리 1584 km
2단 낙하위치
지상거리 2804 km

7 Launch Operation System

Launch Operation System

blanket**Launch Command Center (MDC)**is about the launch of Nuriho**In charge of overall command**.Launch related

Receive reports on facility situation information and make a comprehensive judgment

※Provide information to the Launch Management Committee to determine whether to launch the final launch.

blanket**Launch Control Center (LCC)**While controlling the central public facility located on the launch pad,

It performs the role of controlling and monitoring propellants and gases, etc. and stands by for launch commands.

blanket**Flight Safety Control Center (FSC)**From the launch of Nuriho until the end of the mission

Handles all tasks related to flight safety

blanket**Launch Safety Control Room**Safety of launch site, sea and airspace for launch safety during launch

Monitoring and Control

<Launch Command Center,MDC>

<Projectile Control Center,LCC>

Flight Communication and Tracking Control

blanketTo track Nuriho**Naro Space Center**and**Tracking radar in Jeju Island**and

telemetry antennais installed and operated,**Tracking the second half of the flight**For

Telemetry antenna at Palau tracking stationis installed and operated

- At Naro Space Center **Maximum3,000 km**Track the projectile until**Real-time location information**can be secured **tracking radar**and**Maximum2,000 km**Up to the launch vehicle**Flight trajectory, operational status**You can check your back **Telemetry (remote data reception equipment)**Building a back·operate
- **tracking radar**Is **Measure Nuriho's location information (azimuth, distance, elevation)**
- **remote data reception equipment**Is**Nuri's flight trajectory and operational status**Check the back, remote dataS-band(2.2GHztreason)Using radio frequency**Satellite network, submarine optical cable network**Through**Transmission**

Nuriho Tracking Control Range

☐ Jeju Tracking Center

yep and affection kyung :1,242 m2(Telemetry 2energy,Radar 1energy)

blanket foot buy Jeong Gyeong and blanket Police Inspector

Reception/Real-time processing

- Tracking radar for continuous tracking and information reception of the projectile1Roof tile remote data reception equipment (Telemetry) 2Giga location
- The remote data reception equipment receives overall operation and status information of the satellite and launch vehicle from launch until the satellite separates and enters orbit.
- At Jeju Tracking Center1Single separation, pairing separation,2Tracking and remote data reception for single separation, etc. are possible.

Tracking Radar Dong

<Remote data reception equipment operation,TLM1>

<Remote data reception equipment operation,TLM2>

☐ Palau Tracking Station

yep and Jeong Gyeong:approximately28,000 m_2

blanketReal-time flight location and flight status tracking of Nuriho and its payloads·

Facilities for verification

- 7.3 mand4.6 m Construction of a rapid remote data reception antenna, satellite communication network, and submarine optical cable network, up to approximately1,700kmCapable of receiving remote data and images from long-range projectiles
- At the overseas tracking center (Palau)3Data can be received regarding single engine shutdown and satellite mockup separation events.

☐ Main equipment (range system) configuration and functions

division	composition		function
rain line container god page rain	tracking radar		Obtaining/storing location information through tracking of the launch vehicle and transmitting it to the launch control equipment (installed at the Naro Space Center and Jeju Tracking Station)
	optical tracking equipment		Using infrared cameras, distance measuring radars, and video cameras, the launch vehicle is tracked from the moment of launch to the early post-launch period, acquiring location information and flight-related video information and transmitting it to the launch control equipment.
	remote data reception equipment		Projectile(1step/2step/3Receiving various status information on the satellite (single/video), processing real-time data, and providing key information to launch control equipment (installed at Naro Space Center, Jeju Tracking Station, and Palau Tracking Station)
flight safety equipment	Flight termination command equipment		Transmission of a flight termination command when abnormal flight is determined, such as deviation from the expected flight trajectory of the projectile.
energy award page rain	rising radar	weather radar	Real-time stereoscopic observation of the launch vehicle flight trajectory and clouds surrounding the launch pad
		Comprehensive lightning strike Detection system	Launch support through lightning observation near the space center
		meteorological satellite Receiving equipment	Understanding cloud front conditions and meteorological phenomena using satellite reception information
		AWS	Automatic measurement of wind direction and speed at different heights at the space center launch pad
firing Control equipment	Launch control system		- Server computer equipment that receives/processes/distributes/displays projectile information acquired from tracking/measurement equipment - Space Center internal and external communication network (LAN/Voice-only communication equipment/standard time communication network, etc.)
etc	high-speed camera		Used to analyze the launch behavior of the launch vehicle takeoff stage

8 Participation in launch operation of integrated system enterprise

☐ Participation in launch operation

blanket **General enterprise**Hanwha Aerospace is4**Preparing to launch the car**and**Operation**to **participation**So **In the future** Nuriho launch **private sector-led**as**progress**To do**technology**second**Acquisition**

location	Number of participants	Scope of participation
Launch Command Center (MDC)	4number of people	Participation in launch preparation, launch mission control, launch safety, launch support, etc.
Launch Control Center (LCC)	16number of people	Participation in launch vehicle preparation and testing, launch preparation, and launch operation
launching pad(LP)	10number of people	Participated in launch vehicle inspection, thrust vector actuator work, and electric umbilical/ hydraulic vent system inspection work.
Projectile transport safety	2number of people	Participation in safety management during launch vehicle transport

☐ Future launches (5Tea~6The role of a system integration company in the tea industry

blanket**5Car launch**In**Status of technology transfer acquisition based on launch operation review results**Taking into account the back **System integration company**Launch Command Center (MDC)and launch control center (LCC)etc. **Promoting expansion of participation**

blanket**6Car launch**In**Launch Director (MD),Launch Operations Manager (LD)andLCC** **Some consoles**second**exception**do**All integrated system companies participate**I plan to do it

9 Launch conditions and boundary zone setting

☐ Launch weather conditions

Weather items	Launch conditions	note
temperature	- below zero10℃~video35 ℃	
humidity	- 98%below (25 ℃standard)	
enter	- 947 ~ 1040 hPa	Concerns about changes in atmospheric density
surface wind	- Erector fixed: average wind speed18m/s,Maximum instantaneous wind speed26 m/s - Launch: Average wind speed15 m/s,Maximum instantaneous wind speed21 m/s	During launch operation Concerns about instability
high-rise winds	- q·α < 200 kPa·deg	Flight controllability is not secured and Overload concerns
Lightning and clouds	- Conditions where there is no possibility of an electrical phenomenon occurring near the flight path	Payload during flight Concerns about electrical damage

☐ Possibility of space object collision

blanketorbiting the spacecraft on the day of launch**space objects**of**Analyze orbital information**So

Reviewing the possibility of a collision with Nuriho

- After analyzing the time and location information of space objects orbiting the planet passing around the orbit where Nuri is scheduled to fly, a time period with a sufficiently low risk of collision was selected as a possible launch time period.

<Proximity criteria for space objects>

Target	hour	Launch conditions
manned spacecraft	Launch vehicle liftoff ~ satellite orbit1Cycle point	Proximity200 kmmore
unmanned space objects	Launch vehicle liftoff ~ before satellite orbit insertion	Collision probability≤ 1E-5

☐ Space environment impact

blanket**solar activity level**((**sunspot explosions, solar particle influx, geomagnetic disturbances)**etc.

that can affect space objects**Space environment influencing factors**consideration

※Each situation is low intensity0From the highest level5Up to the stage6It is divided into dog grades,**4step**

Increased potential impact on space objects when an abnormal space environment alert is triggered

<Impact of space environment conditions and conditions for launch delay >

Factors for judging the space environment	Target of influence	Launch Delay Conditions (Recommendations)
Sunspot explosion (R)	Satellite and launch vehicle communications	4~5When a step solar flare occurs (R4~R5)
Solar particle inflow (S)	Satellite and launch vehicle electronic equipment	4~5When a step solar particle inflow occurs (S4~S5)
Geomagnetic disturbance(G)	Satellite orbit error (satellite drag, etc.)	4~5When a step-wise geomagnetic disturbance occurs (G4~G5)

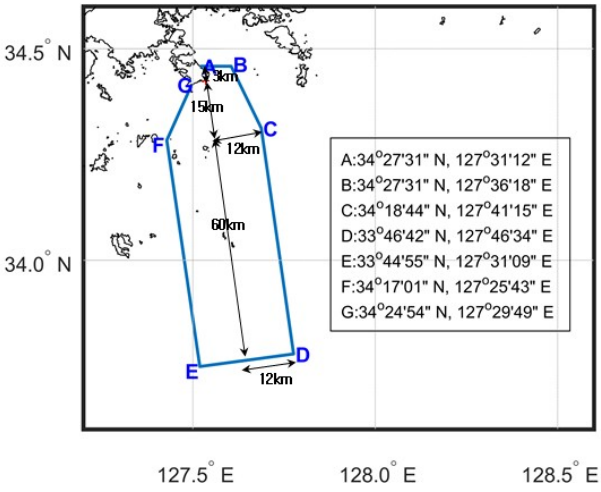
※beautyNASA(NASA)Solar activity(Solar Activity)Launch guidelines according to

☐ Nuriho launch zone

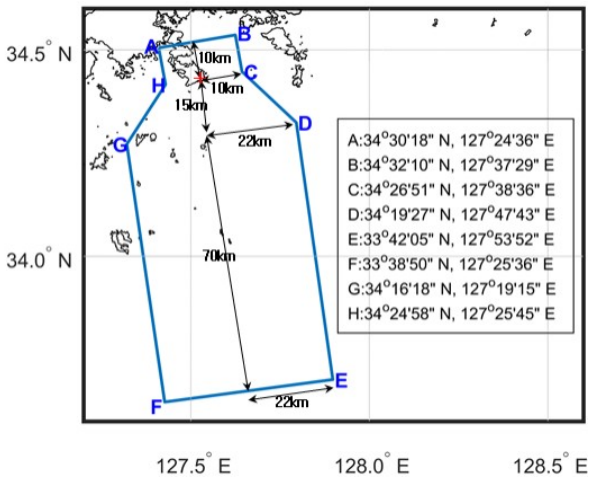
blanket**(Land Control Zone)**Radius around the launch pad3 kmwithin

blanket**(Maritime control zone)**Flight direction width24 km,length78 kmWithin the maritime range

blanket**(Air control area)**Flight direction width44 km,length95 kmWithin the airspace



<Maritime Control Zone Scope>



<Air Control Area Scope>

Attachment1 Overview of the Korean Launch Vehicle Advancement Project

☐ Business Overview

blanket**(Business Purpose) Repeated launch of Korean launch vehicles and transfer of civilian technology**Through

Improving the reliability of the launch vehicledo**Fostering the domestic launch vehicle industry ecosystem·Development**

blanket**(Business period)**2022Year ~2027Year (total)6year)

blanket**(Business contents)**gun6,873.8100 million won

blanket**((Ministry/Institution in charge)**Korea Aerospace Research Institute (KARI), private companies

blanket**(Main contents)**Nuriho is repeatedly launched according to the government satellite launch demand,

Transferring Nuriho development technology to the private sector to discover integrated systems companies.·upbringing

<Nuriho launch and satellite loading plan >

※my4Chawoo Space Development Promotion Foundationplan, proposal22The National Space Committee,22.12.21

3Tea launcher(2023year)

[Main satellite]

satellite	Next-generation small satellites2like
Related business	Small satellite development
Business period	'17~'23year

[Sub-satellite]

civilian·Through institutional competition and selection **CubeSat7energy**•Additional loading

* Astronomy and Space Science Institute4Ki (Toyosat), Lumir1Ki, Kairospac1Ki, Justek1energy

4Tea launcher(2025year)

[Main satellite]

satellite	Next-generation medium-sized satellite3like
Related business	Development of next-generation medium-sized satellites
Business period	'19~'26year(2step)

[Sub-satellite]

Small component space verification cube satellite, competition and Cube Satellite, etc. selected by public contest12energy•Mount

* Spacelintech, Hancom InSpace, Electronics and Telecommunications Research Institute, Woozootech, Quaternion, Seoul National University, Inha University, KAIST, Sejong University, and Korea Aerospace Research Institute1Ki, Cosmo Works2energy

5Tea launcher(2026year)

[Main satellite]

satellite	microsatellites2~6like
Related business	Development of a micro-satellite constellation system
Business period	'20~'27year

[Sub-satellite]

Platform Cube Satellite for space verification of domestic industrial components, private sector·Institutional public offering cube satellite, etc. 10 energy

6Tea launcher(2027year)

[Main satellite]

satellite	microsatellites7~11like
Related business	Development of a micro-satellite constellation system
Business period	'20~'27year

[Sub-satellite]

CubeSat, a platform for space verification of domestic industrial components, selected for the CubeSat Competition.

etc.

☐ Nuriho specifications and features

Length/Weight:47.2 m/200ton

- fuel(56.5tone), oxidizer (126ton)

○Load weight:2.2ton(SSO 700 km)

blanket two mouth Track do womb dong do (SSO)

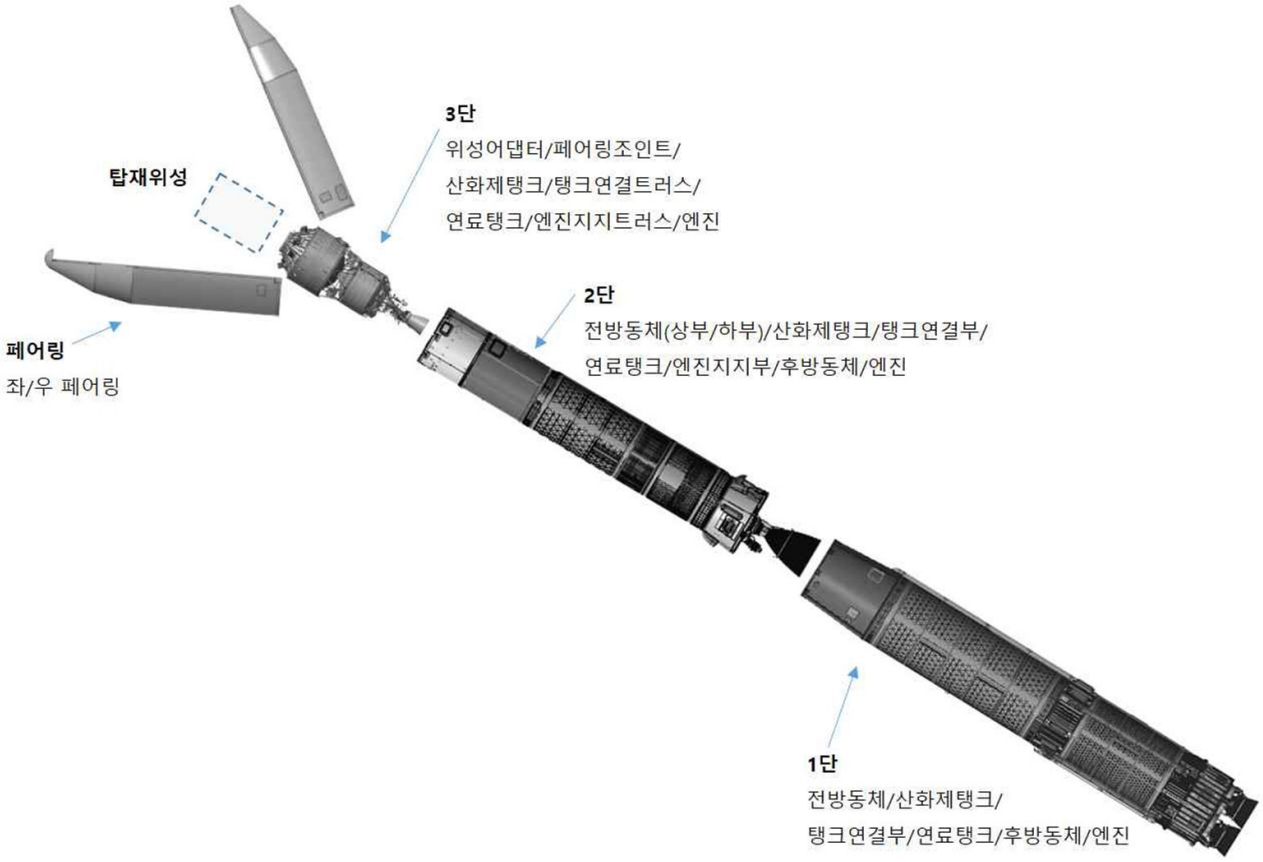
Low Earth orbit (LEO)

Maximum diameter:3.5 m

○Single-component structure

- 1step :75Ton-class liquid engine4energy
- 2step :75Ton-class liquid engine1energy
- 3step :7Ton-class liquid engine1energy

<Nuriho's individual composition >



Attachment2

Nuri launch time determination process

☐ Main payload satellite requirements

blanketNuriho4Next-generation medium-sized satellite, the main payload satellite of the car launch3Lake is high600 km

The local time of the ascending node of the solar synchronous orbitLTAN)* 12:40 ± 10 minrequest

- To start the mission during a time when there is less interference from sunlight for the satellite's main mission of observing the aurora.

* Seunggyojeom local city (LTAN (Local Time of Ascending Node):The moment the satellite passes the equator from south to north, the solar time in that area

☐ Launch time determination process

○ Jeong top oljeong ○ sa ○ ○ Kyung Jeong-kyung blanket follow

Calculate launch time by reverse calculation

- Reflects the requirements for the local time of the embarkation point, the time from takeoff to satellite separation, the longitude when the separated satellite first arrives at the embarkation point, and the time required to arrive.

○ Feet Sa Sa Kyung Kyung Kyung Sa kyung kyung Naro Space Center2

The launch time is based on the launch pad.00:54 ~ 01:14Calculated as

☐ Final launch time determined

blanketWeather conditions on the day of launch, weather conditions, possibility of collision with space objects, space environment

Taking into account the analysis results, etc., on the day of launch (D-0)Final decision expected by the Launch Management Committee

Attachment3 Introduction to Naro Space Center

☐ Naro Space Center Overview

◯ **Space launch vehicle development**Essential for**infrastructure**interest,**Launch operation**Built for **First in Korea**of**Space launch vehicle launch site**

- **(1Step Establishment)**Naro (100kgConstruction of research facilities and launch pads for urgent satellites09.6month Completion)
- **(2Step Establishment)**Korean launch vehicle (1.5Construction of research facilities and launch pads for ton-class satellites

《 Current Status of Naro Space Center 》

- **location**:Yenae-ri, Bongrae-myeon, Goheung-gun, Jeollanam-do
- **site**:Entire site5,523,175 m_2(approximately167Cartoon),Facility site562,380 m_2(approximately17Cartoon)
- **Total floor area**:91,264 m_2(approximately2.7Cartoon)

☐ Main facilities

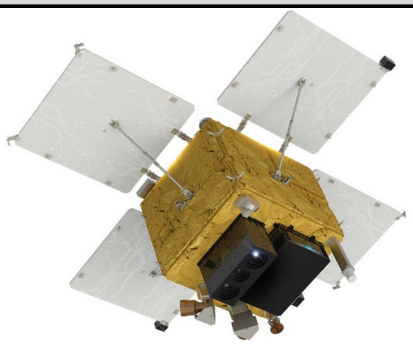
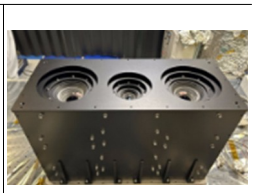
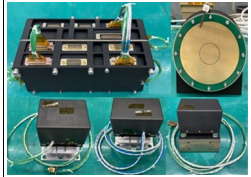
◯ (Facilities) Launch pad, propulsion engine test·equipment·Assembly testing, support facilities

◯ (Research facility location map)

Attachment4

Satellite details

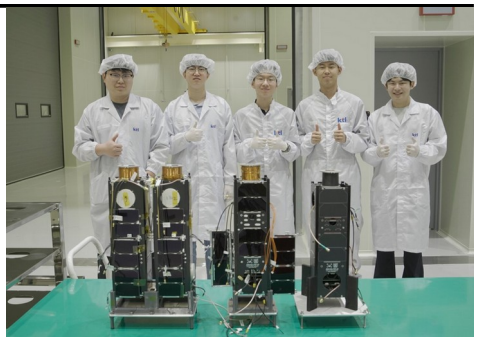
☐ **Next-generation medium-sized satellite3like(KAI)**

division	detail		
Satellite shape			
Satellite name	Next-generation medium-sized satellite3like /Compact Advanced Satellite-3		
Developer	(General) Korea Aerospace Industries, Ltd. / (Payload) Korea Astronomy and Space Science Institute, Korea Satellite Research Institute, Hallym University		
Development period	January 2021 - January 2026 (61months)		
Participating personnel	Team Leader Jongjin Jang, etc.66number of people		
Satellite Overview	- size :1.92(Ø) x 1.76(H) (Launch status) 4.25(Ø) x 1.76(H) (Mission Status) - weight :577.5 kg (Maximum) - Altitude:600±5 km (Sun-synchronous orbit) - Mission Life:1More than years (Biocabinet:60(more than one day)		
Mission purpose and Main features	- Development Purpose: Space science and technology and verification of Korean launch vehicles - Main mission: Space-based wide-field atmospheric glow observation camera (Astronomy and Space Science Institute) Medium-sized satellite-mounted bio cabinet (Hallym University) Space plasma-magnetic field measurements (artificial intelligence)		
Payload (Key Technology)	ROKITS Wide field of view for space atmospheric light Observation camera (Astronomy Institute)	- weight :59 kg (XTU 16 kg(not included) - size :650mmx286mmx420mm - Function: Study of space weather phenomena through observation of space aurora and airglow	
	Bio-Cabinet Bio3D Printing (Hallym University)	- weight :55 kg - size :730mmx590mmx249mm - Function: Bio Stem Cell Bio3D Printing and33D cell culture system	
	IAMMAP Cosmic plasma-Magnetic field measurement (Inwiyeon)	- weight :13 kg Size: Composed of individual items - Function: Monitoring of ionospheric anomalies, low-altitude ionosphere using magnetometers and plasma probes Observation of physical properties and dynamic changes	
Development background and significance	- **Domestic development**:Developed with domestic technology500 kgNext-generation medium-sized satellite standard platform		

	Developing the main body using technology3Equipped with a space science payload - **Space core technology verification and scientific research**:Medium-sized satellite-mounted bio3DVerification of core space technologies and space science research through printing, aurora/atmospheric observations, and observations of ionospheric space environment changes. - **Securing space technology competitiveness**:Development of a satellite with a domestically produced and improved propulsion system • Domestically produced propulsion components3Jonggap development(Propellant tank, latch valve, charge/discharge valve) • flightSW/Posture control development(Standard architecture design considering scalability) • Onboard computer development(ExtensibleHW Development of a base reconstruction unit) • Integrated power control distribution device(Integrated development of power control devices/power distribution devices) • Application of alternative/domestic materials(Alternative materials:HM63/M18Composite materials/domestic materials:HM63/Korea Carbon Resin)
Future plans and Expected effect	- Securing advantages such as improved price competitiveness, shortened production period, improved quality, and overcoming export regulations. - Strengthening the export competitiveness and technological capabilities of domestic satellite platforms.
Main Schedule (Planned)	- Initial Communication and Initial Operation: ~12.27. - On-orbit test: ~2026.1.

☐ **Snooglet-III(Seoul National University)**

division	detail

Satellite shape		
Satellite name	Snooglet-IIIOne/two (SNUGLITE-III HANA/DURI)	
Developer	Seoul National UniversityGNSSLaboratorySNUGLITEteam	
Development period	July 2022 - October 2025 (40months)	
Participating personnel	Director Ki Chang-don and the Chief of Staff14number of people	
Satellite Overview	- size :100.0 x 226.3 x 340.5 mm (6U,(before launch ~ separation) 100.0 x 100.0 x 340.5 mm (3U,(After separation) - weight :7.204 kg (each3.602 kg) - Altitude:600 kmSun-synchronous orbit (SSO) - Mission Life:1year	
Mission purpose and Main features	- Development Purpose: Education and Technology Verification - Main mission:GPSFormation flight and rendezvous-docking through thrust-free orbit control using base Earth atmosphere observation and relative navigation	
Payload (Key Technology)	Equipped with 'relative navigation' and 'orbit control' technologies essential for satellite constellation operation. - **GPSBased on high-precision relative navigation**:GPSEach satellite uses the signal to calculate its own absolute position. They communicate with each other through inter-satellite communication.GPSThe exchange of measurement values and position information allows for precise calculation of relative positions between two satellites. Utilized on the ground.RTK(Real-Time Kinematic)Applying technology, centimeters (cm)Perform formation flight and rendezvous-docking missions through high-precision relative position calculations. - **Thrustless orbit control using extremely thin air in low-orbit orbit**:The two satellites' attitudes and orbital positions are fine-tuned by utilizing the minute aerodynamic drag (atmospheric resistance) exerted on the satellite surface by the extremely thin gas in low Earth orbit without thrusters*. In particular, this is the world's first thrust-free orbit control system in which satellites autonomously determine and control their orbits, enabling them to be applied to formation flight and rendezvous-docking missions. * A typical multi-satellite constellation is driven by thrusters, which makes it expensive and requires fuel loading.	
Development background and significance	- Twin CubeSatsSNUGLITE-III 'one(HANA)'Wow, 'Duri(DURI)'By performing orbital separation, inter-satellite distance adjustment, formation flight, and rendezvous-docking missions, it verifies key technologies essential for future autonomous operation of constellation satellites and cooperative missions between multiple satellites. - Through formation flightGPSdata collection,GPS-RO(GPS Radio Occultation)By utilizing the technique, we can conduct high-altitude precision observations of the Earth's atmospheric elements such as temperature, pressure, and humidity, all over the Earth, especially in oceanic and high-altitude regions where existing ground observatories have not been installed.3Obtaining dimensional atmospheric information	
Future plans and Expected effect	- 2On the Daeui Cube satelliteGPSSimultaneous data collection and ground transmission are performed to cover the entire globe, including oceans and high altitudes.3Obtaining dimensional atmospheric information through existing ground observations	

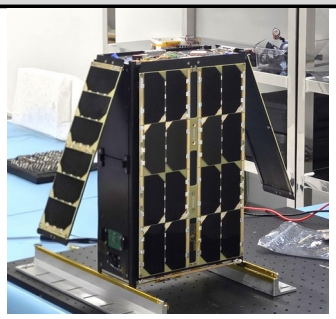
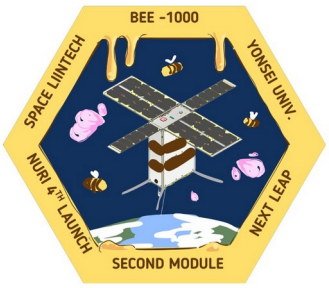
	Contributes to improving the accuracy of weather forecasting and complementing the limitations of the center. - Securing core technologies necessary for future satellite constellation operations and multi-satellite cooperation through the world's first space demonstration of relative navigation and formation flight technology using CubeSats.
Main Schedule (Planned)	- Initial communications and operations (launch date +2Day) - Satellite status check and test run (launch date +9Day) - Satellite separation (launch date +10Day) - GPSAtmospheric observation and relative navigation, formation flight mission verification (launch date +1moon) - Rendezvous-Docking Mission Verification (Launch Date +2moon) - Long-term operation after undocking (until end of life)

☐ **Spyron (Sejong University)**

division	detail
Satellite shape	 
Satellite name	Spyron /SPIRONE
Developer	Sejong University
Development period	May 2, 2022 - November 4, 2025 (42months)
Participating personnel	- Participants: Kwon Soon-hwan, Park A-yeon, Kim Min-ji, Kim Ki-hyeon, Jo Hye-won, Lim Hyeong-gu, Jeong In-ah, Park Yu-hyeon, Yoo Seung-hwan, Lee Kyung-min, and Ahn Do-eun

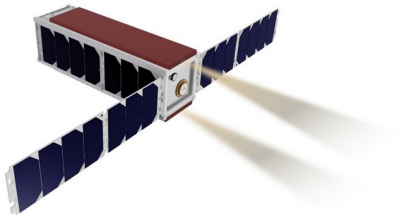
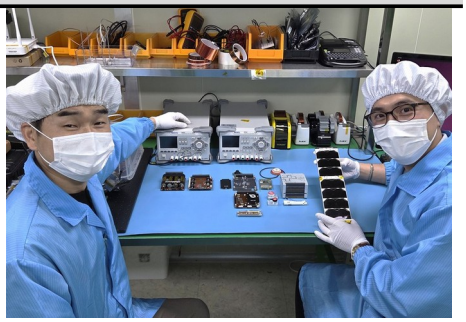
	- Supervisor: Kim Oh-jong
Satellite Overview	- Size: Standard2U - Weight: approx.2.5 kg - Altitude:600 km,Sun-synchronous orbitMLTAN 12:40 PM - Mission Life:1More than years
Mission purpose and Main features	- Development Purpose: Technology verification and space technology education - Main mission: Equipped with a low-orbit navigation signal transmission module2.4 GHz S-bandTransmission and verification of satellite navigation signals in frequency bands,LWIR·SWIRUsing cameras to conduct marine plastic distribution observation missions
Payload (Key Technology)	- **low orbit**(LEO)**Navigation signal transmission module**:Self-developed2.4 GHzTransmission and verification of low-Earth orbit environmental navigation signals using a satellite navigation signal transmitter - **LWIRcamera**:Observing marine plastics using temperature differences between plastic and sea surface. - **SWIRcamera**:Identifying plastics by utilizing different reflectance characteristics for each material
Development background and significance	- It is a cube satellite for university research/education developed by Sejong University, and is in low orbit (LEO) Performing and verifying satellite navigation technology and marine plastic waste island detection missions on a single platform. - Exploring the possibility of building a future low-orbit-based satellite navigation system through space demonstration of a navigation signal transmission module.LWIR·SWIRContributing to securing space-based marine environmental monitoring technology through the operation of video payloads. - structure·heat·electrical energy·communication·ADCS·C&DHSecuring university-level, self-sufficient Cube Satellite development capabilities through self-integration and testing of the back subsystem.
Future plans and Expected effect	- Analysis of signal stability, transmission strength, link budget modeling, etc. through orbit operation and reception signal processing results of the navigation signal transmission module. - IRDevelopment and Verification of an Algorithm for Detecting Marine Plastic Debris Using Camera Arrays - education·We anticipate the creation of an ultra-small satellite technology ecosystem through expanded industry-academia cooperation.
Main Schedule (Planned)	- Initial Communication: After Launch7Perform communication and analyze satellite status within one day - Mission Operation: Approx.1Navigation signal transmission module in low earth orbit per year andIRPerformance verification of camera mount

☐ **lowliness(**(main)**Space Lintech)**

division	detail	
Satellite shape		
Satellite name	Lowly /BEE-1000	
Developer	Space Lintech	
Development period	June 2024 - November 2025	
Participating personnel	Director Yoon Hak-sun28number of people	
Satellite Overview	- size :6U - weight :10.98kg - Altitude:600 km - Mission Life:6months	
Mission purpose and Main features	- Mission Objective: To demonstrate the world's first protein crystallization of the immunotherapy drug pembrolizumab in a satellite-based microgravity environment. - Mission details	

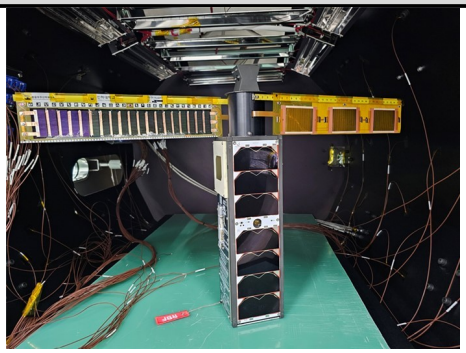
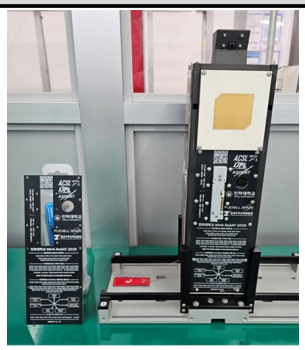
	• Experimental verification of protein crystal growth in a microgravity environment. • Validation of the feasibility of space manufacturing processes for protein-based drugs • High-resolution structure-based drug design(Structure-Based Drug Design, SBDD)E-utilization Obtaining available data
Payload (Key Technology)	**Automated Protein Crystal Growth Experiment Module**(Fully automatic control) • Experiment start time can be adjusted • Temperature control function: Maintains constant crystallization conditions • Experimental Process Monitoring: Inducing Protein Crystal Growth in Microgravity
Development background and significance	- Establishing a space medical research infrastructure through a joint industry-academic collaboration between Spacelintech and Yonsei University's Department of Satellite Systems. - Pembrolizumab, an immunotherapy drug(Pembrolizumab,Keytruda ingredients)Protein crystallization The world's first intravenous injection (proven on Cube Satellite)IV) →Subcutaneous injection (SC)Contribute to improving accessibility to next-generation anticancer drugs by securing basic data necessary for formulation research. - Carrying out space medicine verification missions of a national public research nature, contributing to securing national space bio research sovereignty and technological independence.
Future plans and Expected effect	- Technology scalability and applicability • This protein crystallization technology is a fundamental technology that will have a ripple effect on the overall production of pharmaceuticals in a microgravity environment, and can be widely applied to crystallization research of various biological substances, such as not only pembrolizumab but also vaccine proteins and complex compounds. - Improving research precision and scientific usability • It enables control of the advanced crystal growth process and improved analysis precision, thereby improving the quality of proteins and pharmaceutical substances.3By significantly improving the accuracy of dimensional structure interpretation and the efficiency of new drug target prediction, it can be used as a general research platform from basic life science research to the exploration of new drug candidates. - Development of a next-generation crystallization platform • Based on the experimental data obtained through this mission, the technology will be further developed into a ground-space linked automated crystallization platform.·Specialization • We are developing next-generation space bio-manufacturing technology that meets not only research purposes but also industrial applications (space manufacturing-based pharmaceutical production). - Industrial ripple effects and national strategic value • domestic pharmaceuticals·It is expected to contribute to the technological independence and strengthening of global competitiveness of the bio industry, and to lay the foundation for the development and manufacturing ecosystem of space-based new drugs in the long term. · 'Realizing the public vision of 'Utilizing Space for Human Health' and contributing to Korea's leap forward as a global leader in space pharmaceuticals
Main Schedule (Planned)	- Initial Operation: After Injection~ 11/29 - Onboard body test begins:11/29afternoon~

☐ Cosmic (Space Tech)

division	detail
Satellite shape	 
Satellite name	Cosmic /COSMIC
Developer	- Host organization: Spacerotech - Consortium: Unmanned Exploration Research Institute, Yonsei University
Development period	July 2024 - October 2025
Participating personnel	Director Lee Seong-mun and others20number of people
Satellite Overview	- size :3U (100 x 100 x 340 mm) - weight :4.2 kg - Altitude:600 km - Mission Life:1year
Mission purpose and Main features	- Development Purpose: Securing space heritage in civilian space traffic management technology. - Main mission ① Space verification of space traffic management solutions for sustainable space development • Space verification of satellite mission disposal devices to meet new regulations. • Cloud computing-based space traffic management web platformCOSMOS"verification ② Space Validation of Onboard Computers and Motor Drivers for Space Exploration Rovers
Payload (Key Technology)	- **Satellite post-mission disposal device**(PDM, Post-Mission Disposal):Deorbiting for micro-satellites based on propulsion technology that provides speed increment for the decommissioning maneuver of micro-satellites (De-orbit)device - **For space exploration roverOBCand motor driver**:The purpose of space verification of core lunar exploration rover technologies
Development background and significance	- If the mission is successful, it will be the first case of intentional deorbiting of a satellite in Korea and will be recognized by the international community.

	Contributing to space debris reduction efforts - Federal Communications Commission (FCC)A solution for the post-mission disposal of microsatellites is needed to address the recent strengthening of domestic and international regulations on space object disposal, including the announcement of regulations on space object disposal. - Development of an ultra-small satellite disposal device applicable to ultra-small satellites, in response to the expected increase in demand for satellite disposal devices as regulations on space objects expand. - Domestic production and space verification of core space exploration rover technologies for actual lunar surface maneuvers, domestic production of space-grade actuator technologies, and verification of technology reliability and performance through space mission execution.
Future plans and Expected effect	- Securing systematic space object management and inter-satellite collision prevention technology - Proving technological reliability and performance through localization of space-grade technology and execution of space missions. - Securing the possibility of utilizing space missions in our country's lunar lander project.
Main Schedule (Planned)	- For roverOBCAnd motor driver technology verification: ~3months - Post-mission disposal maneuver technology verification:3months later - Long-term abandonment orbit prediction:3months ~1year

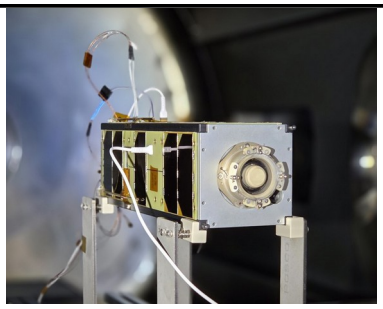
☐ Inha Roseat (Inha University)

division	detail
Satellite shape	 
Satellite name	Inha Roset /INHA RoSAT
Developer	Inha University
Development period	January 2023 - October 2025 (34months)
Participating personnel	Chief Executive Officer Choi Ki-young22number of people
Satellite Overview	- size :100 x 100 x 382.5 mm ((Undeveloped) - weight :5.275 kg - Altitude:600 km - Mission Life:6months
Mission purpose and Main features	- Development purpose: For technology verification and education - Main mission • Cube Satellite-grade rollable solar module operation verification • Verification of space environment operation of self-produced battlefield equipment • Own ground station operation
Payload (Key Technology)	- The world's first cube satellite equipped with a rollable solar cell module - Domestically produced (Flexel Space and Energy Technology Research Institute) cell-mounted - Equipped with a mission computer for development assistance based on commercial non-space grade components - Incheon University-Industry Convergence Center3DUtilizing printed components, using frequencies that can communicate with the Inha University ground station (UHFUp/down,S-Banddownward)
Development background and significance	- Introducing rollable solar cell technology to the Cube Satellite system, which has many power generation constraints due to space constraints, to secure increased power productivity. - Utilizing the commercial component-based Inha University mission computer, verify the space-grade warfare equipment development capability and suggest a low-cost development alternative. - Contributing to the development of talent and expansion of the national space development base through the university-led Cube Satellite Development Program.
Future plans and Expected effect	- Rollable solar cell deployment is performed and rollable solar cell status monitoring is performed based on the measured values of sensors (photodiodes, temperature sensors) attached to the rollable solar cell and the amount of power produced. - The feasibility of operating rollable solar cells in micro-satellite systems and domestically produced rollable solar cells

	Confirmation of the possibility of proposing an alternative as a space-grade component through verification of the space environment performance of solar cells. - Continuous reception and recording of beacon data and housekeeping data through Inha University's own ground station, and status monitoring of satellite buses and self-developed equipment. - Cultivating domestic space industry personnel through verification of Inha University's own satellite development and operation capabilities and accumulation of basic technologies and experience for future satellite project execution based on this.
Main Schedule (Planned)	- Initial Communication (Launch Date +3Day) - Initial operational readiness (launch date +10Day) - Rollable solar module deployment and operation (launch date +6months) - Long-term operation after the mission period ends (until the end of life)

☐ K-Hero (KAIST)

division	detail

Satellite shape	 
Satellite name	K-Hero /K-HERO
Developer	KAISTNuclear and Quantum Engineering Department Electric Thrust Laboratory (GDPL)
Development period	November 1, 2022 - January 31, 2026 (39months)
Participating personnel	Professor Wonho Choi (Principal Investigator), PhD candidate Dongha Park (PM)Light gun7number of people
Satellite Overview	- size :3U - weight :3.9 kg - Altitude:600 km - Mission Life:6months
Mission purpose and Main features	- Development Purpose: Space verification of ultra-small Hall thruster technology - Primary mission: In low Earth orbit150 WA sudden thruster1By operating the detector, the generation of plasma and the generation of thrust due to the acceleration of ions were confirmed.
Payload (Key Technology)	- **AIUtilization design hole thruster*** :KAISTDeveloped by Cosmobee, a startup founded in the Electric Thrust Laboratory of the Department of Nuclear and Quantum EngineeringAIUtilization design with hole thruster * Hall thruster is a space electric propulsion technology that ionizes gaseous propellant and accelerates it through an electric field to generate thrust. In Korea,KAISTIt started first25This is a field that has been studied for years.
Development background and significance	- Self-developed150 WPerform space verification of domestically produced small electric thrusters at low cost by operating a CubeSat equipped with a small Hall thruster.
Future plans and Expected effect	- Accelerate the commercialization of Hall thrusters for ultra-small satellites. - Hall thrusters are a technology used in cluster satellites, ultra-low orbit satellites, and deep space probes, and are expected to be used in low orbit cluster satellites to be developed domestically in the future.(reconnaissance,6GCommunication satellites, etc.)It is expected that it can be used in ultra-low orbit satellites and deep space exploration spacecraft.
Main Schedule (Planned)	- Initial Communications:November 27, 2025 - December 31, 2025 (1)months) - Hall thruster operation:January 1, 2026 - January 31, 2026 (1)months) - Receiving mission data:February 1, 2026 - February 16, 2026 (15Day)

☐ JACK-003, JACK-004((main)Cosmo Works)

division	detail

Satellite shape	 
Satellite name	JACK-003, JACK-004
Developer	Cosmo Works Co., Ltd.
Development period	2024.10 ~ 2025.10 (13months)
Participating personnel	Director of the Research Institute, Yongseong Lee7number of people
Satellite Overview	- size :3U (100 * 100 * 340.5 mm^3) - weight :4 kgbelow - Altitude:600 km - Mission Life:2year
Mission purpose and Main features	- Development Purpose:3UCubeSat600kmIt operates in a high-altitude sun-synchronous orbit, acquires ground observation images of specific locations through an optical payload, and receives them through domestic ground stations. - Main mission: The satellite receives the location information transmitted from the ground station, performs satellite attitude control and data transmission/reception verification to acquire ground images of the corresponding location, and confirms the maintenance life of the image acquisition function.
Payload (Key Technology)	 - **Optical system for CubeSat**:From lens optical design to structural assembly for mounting on a CubeSat, manufacturing to withstand vibration during launch and orbital environment (joint development with partner company Ostek Co., Ltd.)
Development background and significance	- Securing the capability to develop ultra-small satellites by verifying the operational reliability of the satellite, payload, and each component of the satellite manufactured using our own technology in a space environment.
Future plans and Expected effect	- Earth observation images are provided for the public to utilize, and are expected to be utilized in various fields such as geography and the environment.
Main Schedule (Planned)	- Initial communication: After ejection ~3Day - Transmission and reception status check for mission verification: After injection ~15Day - Mission Start: After Ejection15Day ~

Parameter	Value
GSD @500km	5m
Global @500km	10 x 10km
Spectral band (nm)	400~700
MTF @ Nyquist Freq	>0.15
F (#) / EFL (mm)	7 / 600
Sensor Pixel	4.8μm, (2590 x 2048)
Dimension (mm)	95 x 95 x 148
Weight (with Camera)	<1kg
Camera Interface	SPI, UART
Cubesat Standard	3U and Above

☐ Faucet01((main)Quaternion)

division	detail
Satellite shape	 
Satellite name	Faucet01 / PERSAT01
Developer	Quaternion Co., Ltd.
Development period	March 2019 - March 2025 (72months)
Participating personnel	Chief Song Yong-gyu and others6number of people
Satellite Overview	- size :100 x 100 x 366 mm - weight :3.25 kg - Altitude:500 km - Mission Life:6months
Mission purpose and Main features	- Development purpose: Localization of satellite components - Main mission: Jeju Island marine debris monitoring
Payload (Key Technology)	- Payload:**EOcameraOV2640 20**mverification • Technology verification: Domestic satellite components (structure,OBC, EPS, UHFboard, MTQ/ RWetc.) Space environment verification
Development background and significance	- chief mourner·Detection of high-density areas of floating debris and ocean currents along the southern coast·Analysis of movement trends linked to wind power - Development/production period by standardizing the reproducible CubeSat platform·Cost reduction and orbital performance of domestically produced CubeSat bus/payload modules·Reliability verification - At the module level100%(design·manufacturing·assembly·(Test, etc.) Localization andITAR/EAR Risk Reduction Delivery Package (Origin)·Test scores·Establishing a reference for export (based on safety grounds)
Future plans and Expected effect	- Microsatellite platform·Standardization of operating procedures and expansion of industry-academia cooperation education - Localization of CubeSat components: Module-level localization100%
Main Schedule (Planned)	- Initial Communication: Launch Date +1Day - Initial Operational Preparation: Launch Date +7Day, camera transmission and reception status check

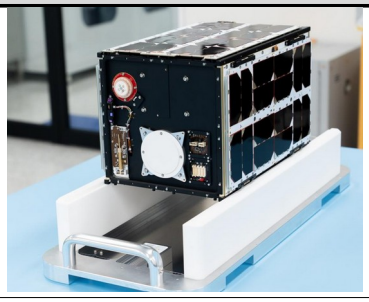
☐ **ETRISat(Electronics and Telecommunications Research Institute)**

division	detail

Satellite shape	 
Satellite name	ETRISat /Etrisat
Developer	Electronics and Telecommunications Research Institute
Development period	January 1, 2024 - December 31, 2025 (24months)
Participating personnel	Responsible person Yoo Jun-gyu et al.24number of people
Satellite Overview	- size :6U (100 mm x 226.3 mm x 366 mm) - weight :7.42 kg - Altitude:600 km MILTAN 12:40 SSO(Sun Synchronous Orbit) - Mission Life:1year
Mission purpose and Main features	- Mission Purpose: Low-orbit micro-satellite-based marine climate prediction serviceIoTdata communication services - Main function: In areas without terrestrial network infrastructureIoTProvision of communication infrastructure
Payload (Key Technology)	- **Pre-6G IoT-NTNVerification communication payload** · 915.5 ~ 916.5 MHzThe substitute200kHzUse by dividing into channels · CSS (Chirp Spread Spectrum)Base low-power transmission technology • World-class Doppler frequency compensation technology · ETRIdevelopmentPre-6G IoT PHY/MACsecondSDRMounted on the platform
Development background and significance	- micro low-orbit satelliteIoTUltra-small satellite-based communication with low cost and no delay in shaded areas without ground infrastructure such as sea, space and desert through network IoTVerification of service technology to respond to global satellite communications market competition using ultra-small communications satellites. - mountainous area·Marine lighting existing ground wirelessIoTA global network that can provide services such as environmental monitoring and logistics monitoring even in areas where it is difficult to establish services.IoTDevelopment of technology capable of providing services - 6G IoT-NTNLeading future communications technology to realize hyper-connected networks by securing core technologies - From global coverageBig DataNew infrastructure and service creation possible through collection
Future plans and Expected effect	- (Future plans) • Marine meteorological information used for analysis and prediction of marine climate changeETRISatCollect periodically through and verify prediction performance of climate change, etc. · ETRISatInternational standardization of technology verified through3GPP)Try to reflect,3GPP Standards-basedIoT-NTNPlans to develop additional satellites - (Expected effect) • satelliteIoTIndustry through technology·distribution·Increase the efficiency of resource management and the environment.

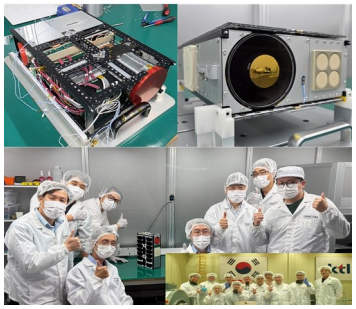
	Contribute to enhancing national safety and economic value by improving the water resource monitoring system. • Satellites that provide connectivity anywhere on Earth and can be applied in various industries and environments.IoTEstablishing a foundation for market entry  <Various micro satellitesIoTService concept diagram>
Main Schedule (Planned)	- Initial communication:November 27-28, 2025 - LEOP/IOT: 2025.11.29. ~ 2026.2.28. - satelliteIoTTest Verification:March 1, 2026 - February 28, 2027

☐ **Domestic component space verification platform1Ho (Korea Aerospace Research Institute)**

division	detail	
Satellite shape		
Satellite name	Domestic component space verification platform1like /E3 Tester-1	

Developer	Korea Aerospace Research Institute (Main Development: Naraspace)
Development period	July 2024 ~ October 2025 (15months)
Participating personnel	Responsible authority symbol, etc.23number of people
Satellite Overview	- size :12U - weight :17.3 kg - Altitude:600 km - Mission Life:6months~1year
Mission purpose and Main features	- Development Purpose: Space verification of domestically developed space-grade components. - Main mission: Verifying the functionality of domestically developed space-grade components in space and securing space heritage.
Payload (Key Technology)	- **Domestic development9End-of-life component verification module**:Resistor, Capacitor, Diode, Magnetic, SRAM, ADC/DAC, Thermistor, Heater - **Memory (Samsung Electronics) Function Verification Module**:NAND Flash, DRAM
Development background and significance	- As most of the existing devices/components developed domestically for space use depend on imports, the need for independent development of space devices/components has emerged. - We expect to expand the sales channels and market for companies by verifying the space environment performance of domestic space devices/components and securing space heritage.
Future plans and Expected effect	- '25year, '26year, '27Year1Continuous fire, continuous fire - '25Launching in the year1Perform space verification of the aerospace components/components (6months~1year)
Main Schedule (Planned)	- Initial Operation:November 27, 2011 - December 5, 2011 - Entering mission mode and performing payload verification:December 5, 25 - December 31, 25

☐ Sejong4like((main)Hancom InSpace)

division	detail	
Satellite shape		
Satellite name	Sejong4like /Sejong-4	
Developer	Hancom InSpace	

Development period	January 1, 2024 - October 31, 2025 (22months)
Participating personnel	Kim Hong-bong, the person in charge15number of people
Satellite Overview	- size :226 x 100 x 340 mm - weight :7.59 kg - Altitude:600 km - Mission life: approx.1year
Mission purpose and Main features	- Development Purpose: Securing satellite system integration/self-development technology, securing heritage, domestic real-time operating system, and space verification of flight software. - Primary mission: Multispectral imaging Earth observation
Payload (Key Technology)	- **multispectralEOcamera**:4.75 m GSD @500km, 19.4 km SWATH 8-Bands, 32 dTDI
Development background and significance	- Self-development capabilities of the Sejong series satellites and acquisition of self-produced data for Earth observation satellite images. - Satellite production and satellite imagery baseIMINT, GEOINTBusiness development
Future plans and Expected effect	Nuriho5Sejong, a satellite equipped with a secondary launch vehicle5Continued launch of the Sejong satellite series, including Ho Strengthening data collection capabilities, expanding application services in agriculture, industry, and other sectors, strengthening technological independence, and securing national security competitiveness.
Main Schedule (Planned)	- Initial Operation: 'November 27, 2025 - December 31 - Mission Verification: 'January 1, 2026 - February 28