



한국천문연구원 우주관측로드맵 소개

Korea Astronomy and Space Science Institute

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Space Science Division

■ Space Weather

- CODEX, SNIPE, Next Generation Space Weather
- KASI-NASA Heliophysics W/G

■ Planet Earth

- Reference Frame, GNSS, Astronomical Calendar
- KPS POD, Ionosphere
- KASI-NASA Space Geodesy LoA

■ Exploration

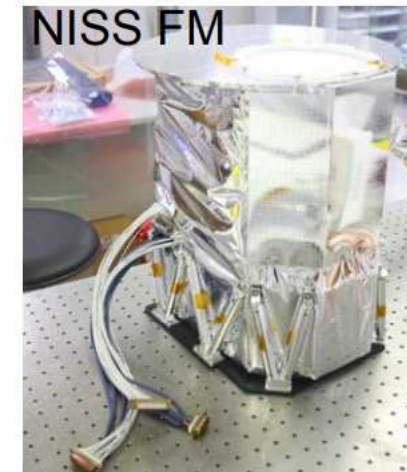
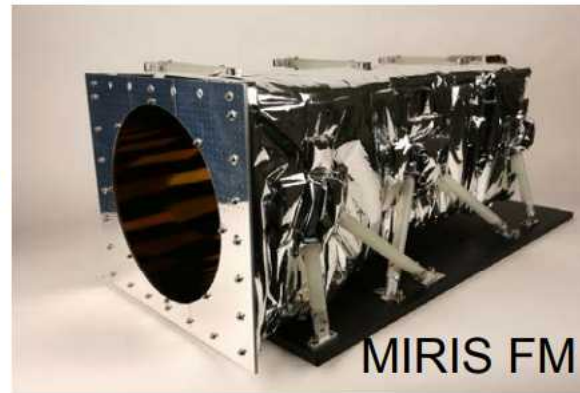
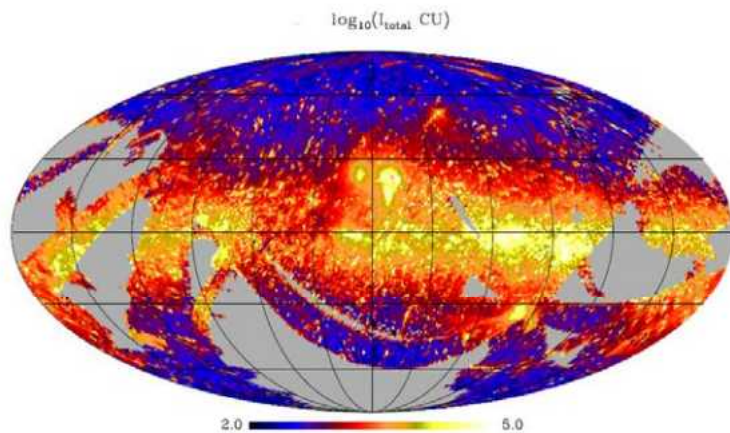
- PolCam/KPLO, CLPS Korea (GrainCams, LVRad)
- Apophis mission, Korean Lunar Lander Instrument
- KASI-NASA Exploration Science W/G

■ Astrophysics

- FIMS – MIRIS – (CIBER) – NISS – (SPHEREx)
- CAS500-3, Korean Space Telescope
- KASI-NASA Astrophysics W/G

Experiences in Astrophysics

- **Small satellites** for demonstration of space technologies
- **FIMS** (2003): Far-UV mission; collaboration with UC Berkeley






- **MIRIS (2013)**: wide-field imager (I, H & Pa α) for survey of NIR sky
- **NISS (2018)**: NIR imaging spectrometer (R \sim 20; 0.95 \sim 2.5 μ m)
 - Optimized to diffuse objects due to limited performance of satellite
 - Could serve as a pathfinder for the SPHEREx Mission
- Past International collaborations: **GALEX (UV)** & **AKARI (IR)** (CIBER)

SPHEREx

■ Imaging Spectroscopic Survey in Near-Infrared

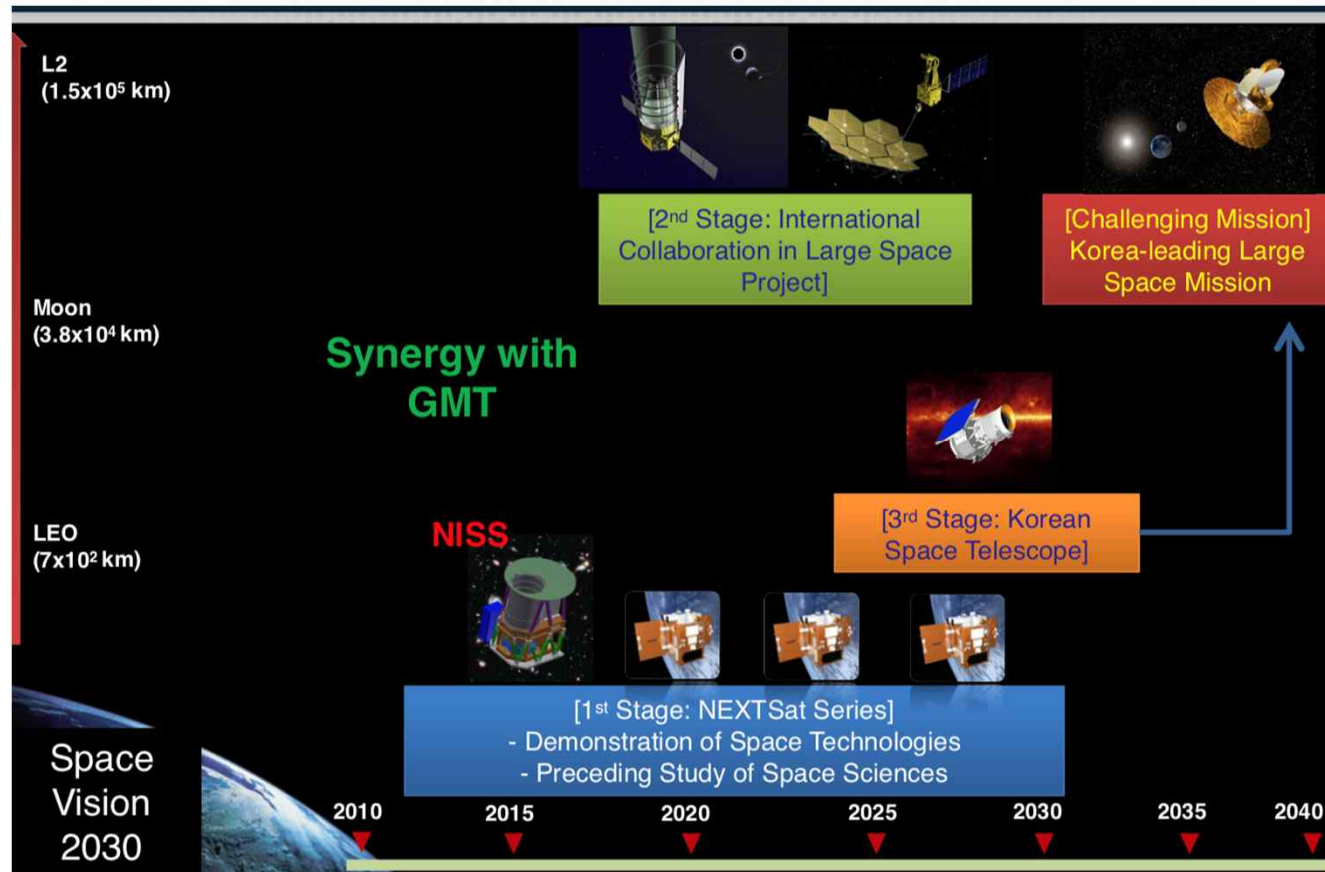
- The Origin of the Universe
- The Origin and History of Galaxies
- The Origin of Water in Planetary Systems

Mission	MIRIS (2014)	NISS (2018)	SPHEREx
Parameter			
FoV	3.6×3.6 deg.	2×2 deg.	3.5×11.3 deg.
Aperture of Telescope	8cm	15cm	20cm
Spectral Coverage	1.1 & 1.6 (1.87) μ m	0.95 ~ 2.5 μ m	0.75 ~ 5 μ m
Spectral Resolution	5 (45)	20	40 - 150
Spatial Resolution	51.6"	15"	6"
Coverage (Deep fields)	~3,000 deg ²	150 deg ²	All-sky
Depth	18 AB mag.	17 AB mag.	19 AB mag.

Future Space Telescope

■ Future Space Telescopes in Korea

- Korean space telescope in 10 years, according to new national space plan of Korea
- To extend science and to find possibility sharing onboard instrument opportunity



New Space Telescope (제안)

■ Science

- Community Input
- Science Instrument

■ Telescope

- 2-3m class → 이중기술 + 해외 대형 우주망원경 사업 협력 (이재준 박사 발표)
- 초경량 소재, 조각거울 방식
- 기술로드맵 작성중 → 한정열 박사 발표

■ Spacecraft

- 다목적 실용위성, 정지궤도 위성, 중형/소형위성
- 자세안정도 (Fine Guidance Sensor기술)

■ Communication/Orbit

- LEO, L2/L4/5 (Satellite relay or Optical Communication)

■ Launch

- KSLV IIA(준비중): 3.4t@500km SSO

Mission to Apophis (제안)

■ Science

- Apophis: Potential Hazardous Asteroid → 2029. 4. 13. Earth approach (~340,000km)
- Physical characteristics (Composition, Density, Structure, Catastrophic changes)
- Instruments: PolACam, Multi-Cam, LIDAR, Magnetometer, Dust Detector, Int'l contribution

■ Mission Profile

- Launch(2026/2027), Cruising(~2028), Mapping('29. Jan-Mar), Hi-res Imaging(Apr), Re-Mapping(May-July), Proximity Operation(July-Aug), End of Mission(Re-entry? Or Deep Space)

■ Spacecraft

- ~300kg(Wet mass)
- Long-Range Optical Communication Demo.

■ Communication/Tracking/Ground

- 35m KDSA, NASA DSN/ESA Antenna
- 우주물체감시레이더(발사초기/Re-Entry), VLBI tracking(Mission phase ~ Re-Entry)
- Cloud-based Ground system

■ Launch

- KSLV II + Kick Motor(~2.05t): C3~ 10 km²/s²

As is ..

2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031~
SNIFE										
		CODEX								
			SPHERE x							
			PolCube							
	PolCam /KPLO									
		CLPS	CLPS							
CAS 2		CAS500 3, 4, 5								
	N.Sat 2									
Nuri								Nuri 2		
K-7/7A	425									
										KPS

To be ..

2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031~	
SNIFE		NG Cubesat									
		CODEX		pSOFT							
			SPHEREx								
		PolCube									
	PolCam /KPLO		Apophis Mission						Re-entry		
		CLPS	CLPS		Lunar Lander Instrument						
CAS 2		CAS500 3, 4, 5			Space Tel. Mission						
	N.Sat 2										
KSLVII								KSLVIA			
K-7/7A	425										
										KPS	