Local Chapter Activity Report

at the 50th Virtual UNISEC-Global Meeting

Youngho Eun

UNISEC - Korea

younghoeun@yonsei.ac.kr

History of Local Chapter Activities

Established in *2024 by 2 Universities (KAIST, Yonsei University)*

UNISEC-Global Activities in 2023-24

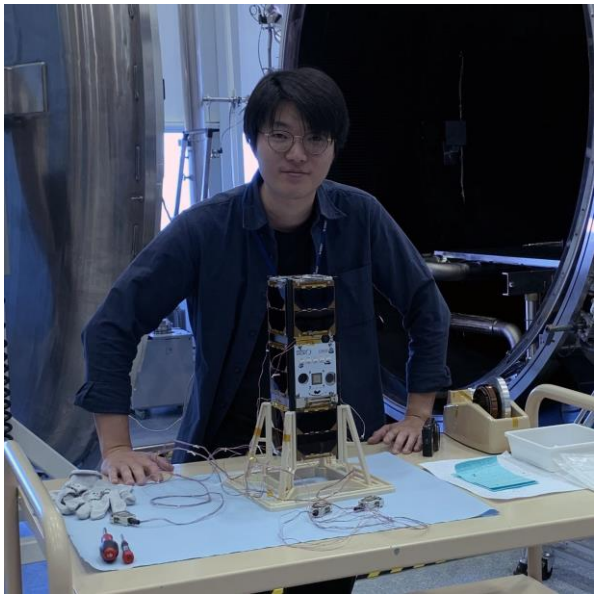
- Points of Contact: 2
- Member Universities: 2
- Students: around 50+
- Professors: 2
- Others（Corporative members, etc.):

YOUNGHO EUN

2018 (Yonsei University)
- PhD

2019 – 2023 (The University of Sydney)
- Postdoctoral Research Associate
- Associate Lecturer
- 3 x CubeSats

2023 – present (Yonsei University)
- Research Professor
- 4 x CubeSats



KAIST

Korea Advanced Institute of Science and Technology

ASCL Aerospace Systems & Control Lab.

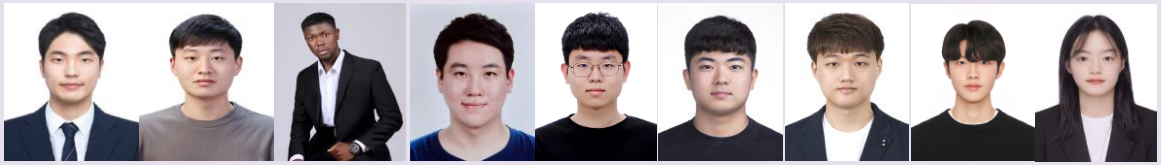
Advisor

Post Doc 4
Ph.D. Candidate 18
M.Sc. Candidate 9

Post Doc (Full Time: 4, Alumni 16)

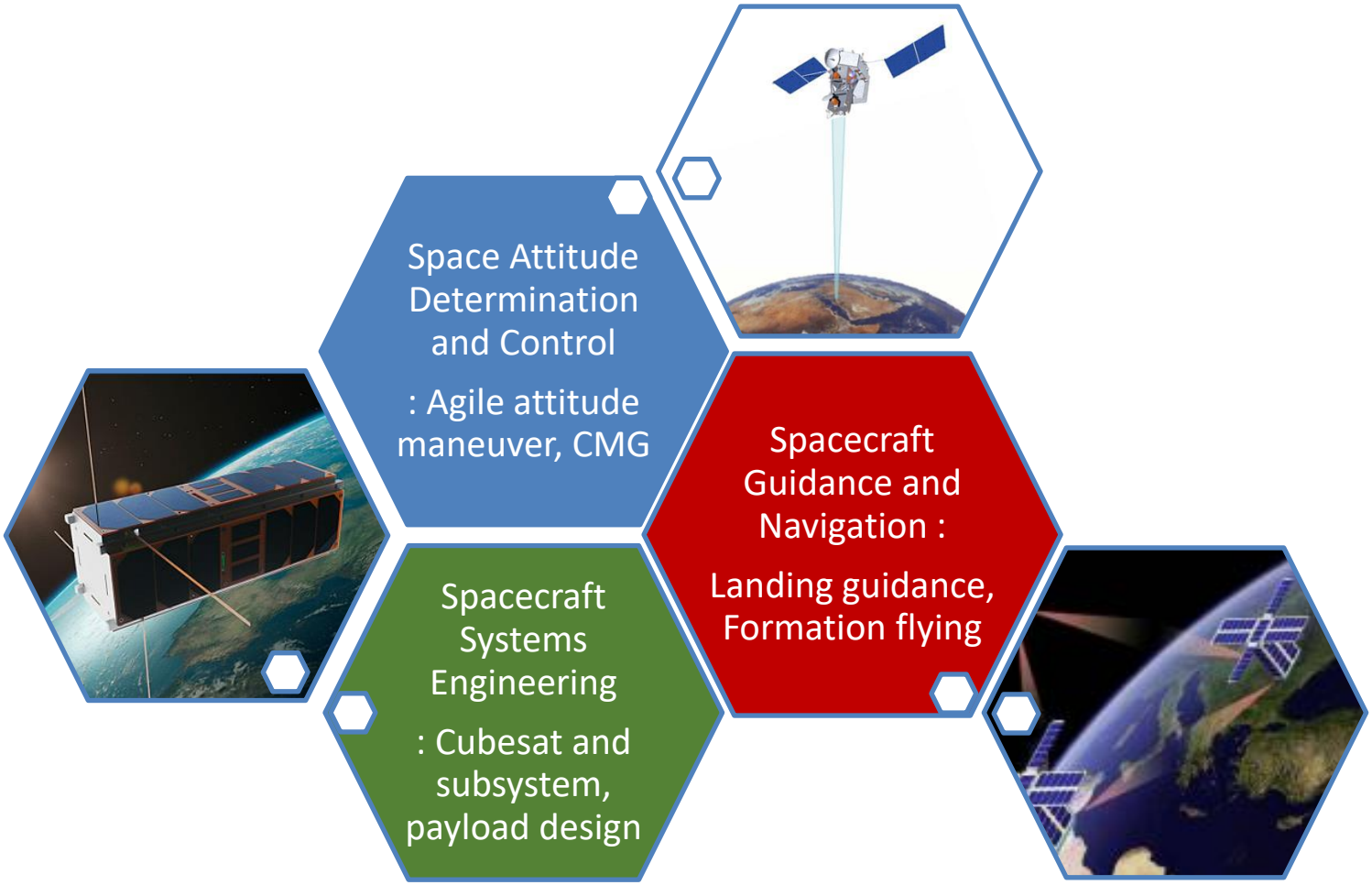
PhD Candidates (Full Time: 18, Part Time; Alumni 60+)

M.Sc. Candidates (Full Time: 9, Part Time; Alumni 66)



KAIST

Korea Advanced Institute of Science and Technology

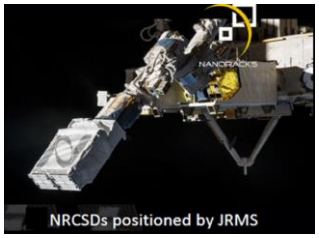


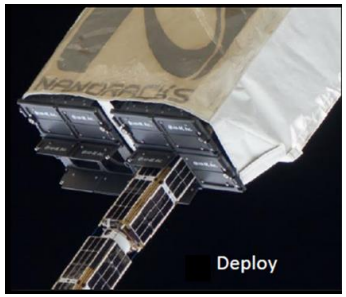
KAIST

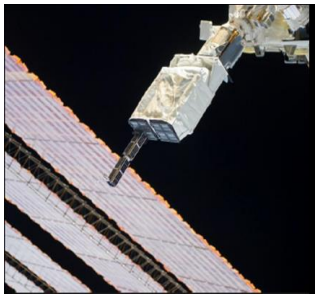
Korea Advanced Institute of Science and Technology

- **QB50(EU Project, 2017)**
  - Network 50 CubeSats in a string-of-pearls configuration
    - More than 70 proposals submitted
  - Main mission objective: observe thermosphere/ionosphere
    - Initial orbit : 400km altitude, 51.6deg inclination(ISS Orbit)
    - Mission period : ~ 6 months
  - Launched at 2017. 03. 16 by Atlas V
    - Deployed by NanoRacks on ISS
- **LINK (Little Intelligent Nanosatellite of KAIST)**
  - Collects science data to make precise atmospheric model
  - Payload: INMS(ion/neutron mass spectrometer) and Langmuir probe (maximize temporal/spatial resolution)


NRCSDs installed by ISS Crew


NRCSDs positioned by JRMS



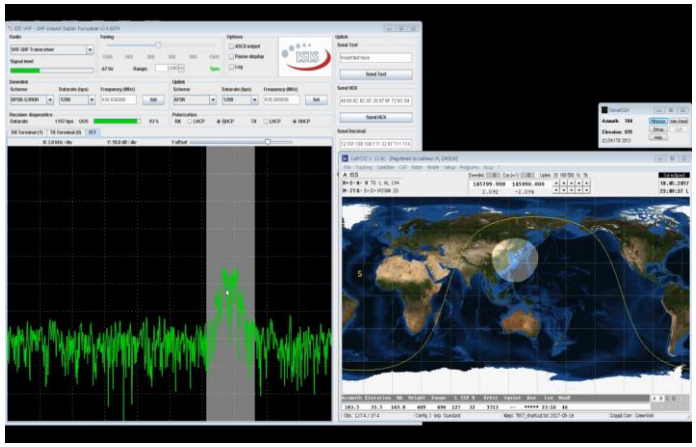


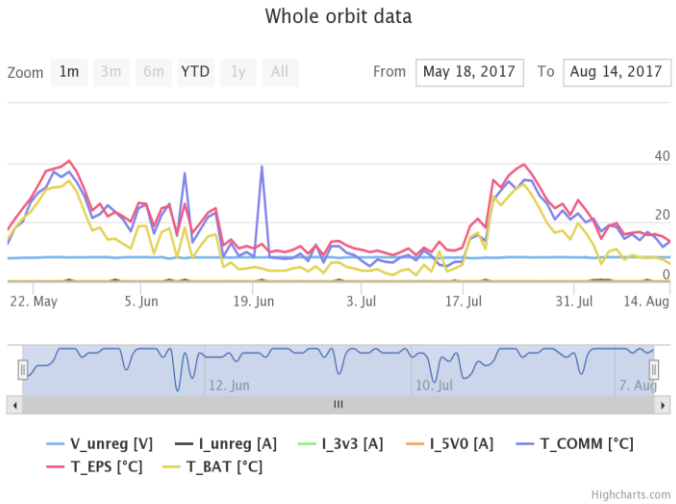
KAIST

Korea Advanced Institute of Science and Technology

- **LINK status**
  - Beacons were received regularly for 90 days
    - All states were nominal.
  - Beacon malfunction occurred in August, 2017
    - I2C communication problem was suspected.

- **Key achievement**
  - Successful first signal reception
  - Satellite operation by own ground station
  - ADCS commissioning experience
  - System design verified to be enough in orbit
  - Langmuir probe data acquisition
  - First INMS commissioning was attempted.

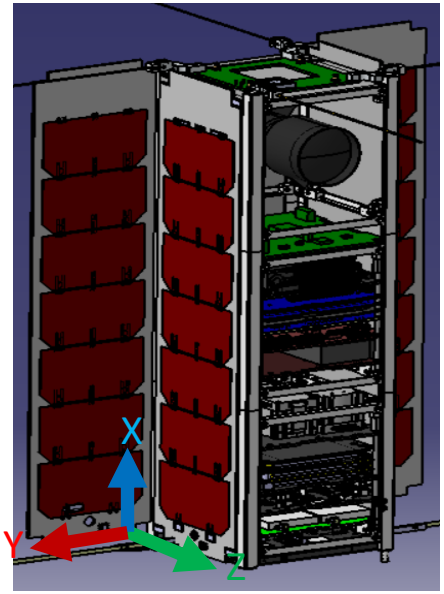




KAIST

Korea Advanced Institute of Science and Technology

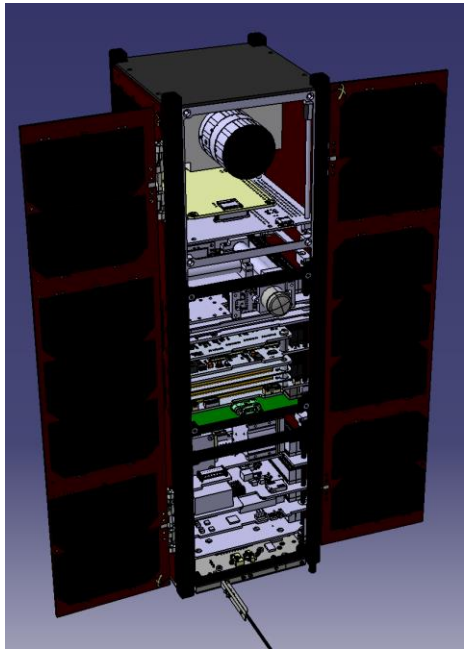
- **K2SAT (KAFA × KAIST SATellite)**
  - **The main mission objective is to improve ground information**
    - Collect image of subject area and enable voice repeating between aircraft and ground station
    - Equipped with camera and voice repeater
  - **Orbit information and lifetime of satellite**
    - Initial orbit : 600km altitude, 98deg inclination
      - Sun-synchronous orbit
    - Mission period : ~ 1 year
  - **Launched at 2018. 06 by Falcon 9**
    - Launch service was contracted with SPACE FLIGHT

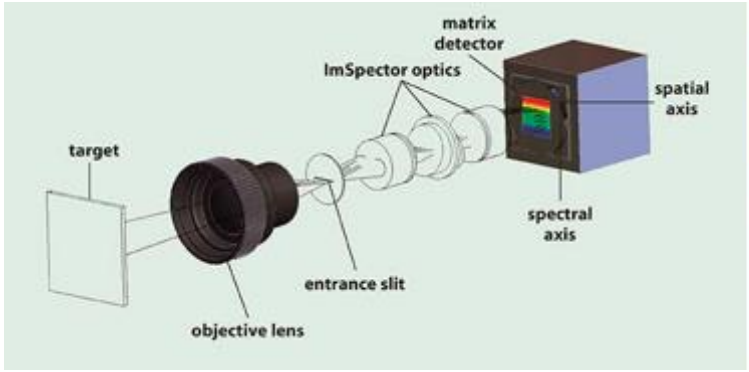


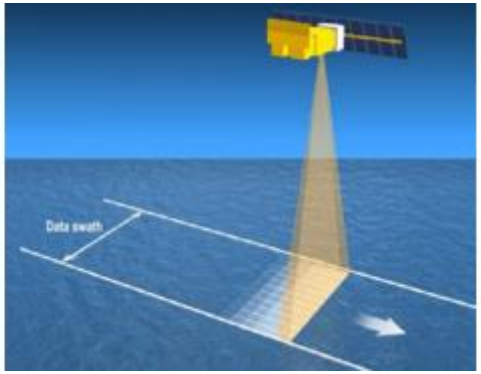
KAIST

Korea Advanced Institute of Science and Technology

- RANDEV (Repeater Arrangement & Disaster Early View, KAIST)
  - Launched at 2022. 06 by KSLV-II
  - Satellite structure
    - Size: 3U (10x10x30 cm^3)
    - Mass: $\approx 3.23kg$
    - Solar panel size: 18 cells (Mounted), 28 cells (Deployed)
  - Primary mission: Earth observation
    - Using hyperspectral camera
    - Push broom (Data size: 3.75 GB (Max.))



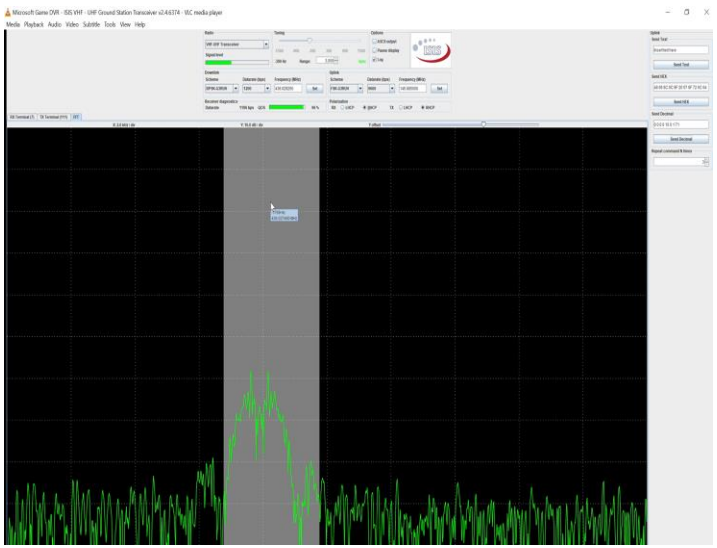


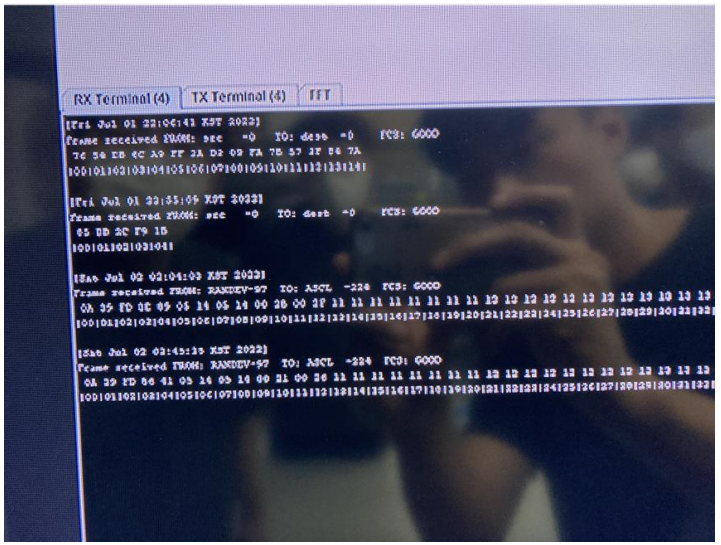


KAIST

Korea Advanced Institute of Science and Technology

- **RANDEV deployment**
  - Schedule
    - RANDEV deployment on 1st, July, 2022
    - Downlink and uplink successful



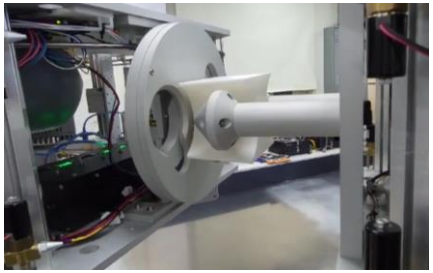


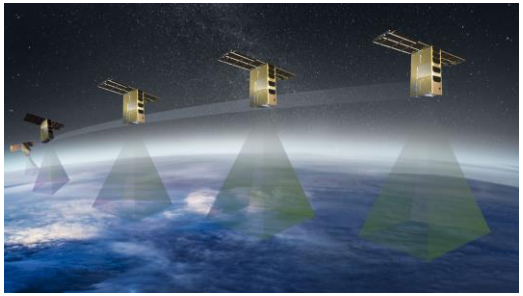
Yonsei University

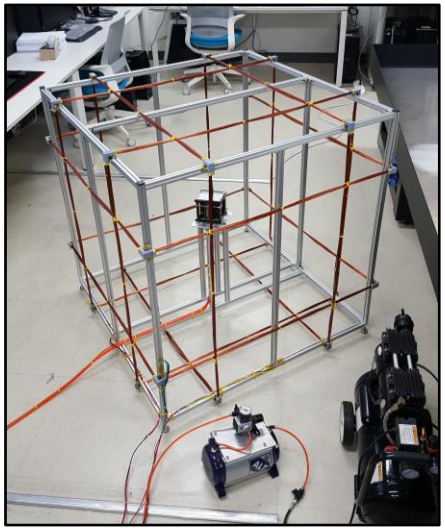
Department of Satellite Systems

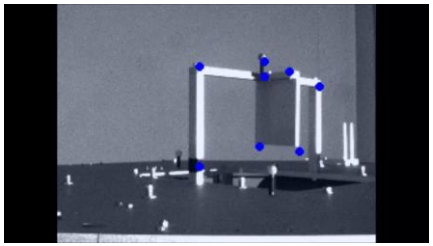
ASTRODYNAMICS AND CONTROL LABORATORY
(Graduate students: 30+, Under graduates: 20+)

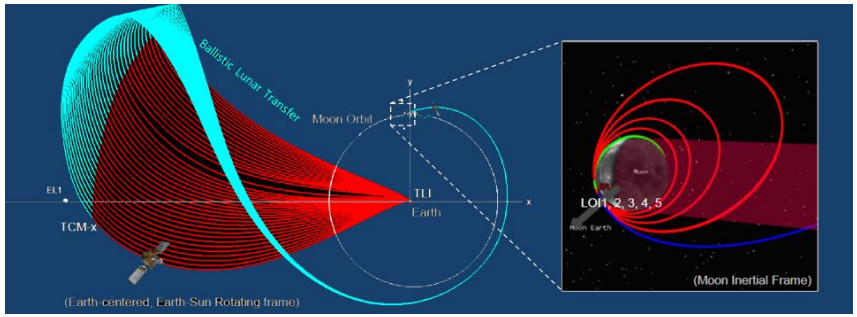
- Mission Design
- Orbit Determination & Control
- Attitude Determination & Control
- Formation Flying
- Rendezvous & Docking
- CubeSats











Yonsei University

Department of Satellite Systems

CUBESAT ASTRONOMY BY NASA AND YONSEI USING VIRTUAL TELESCOPE ALIGNMENT EXPERIMENT (CANYVAL-X)

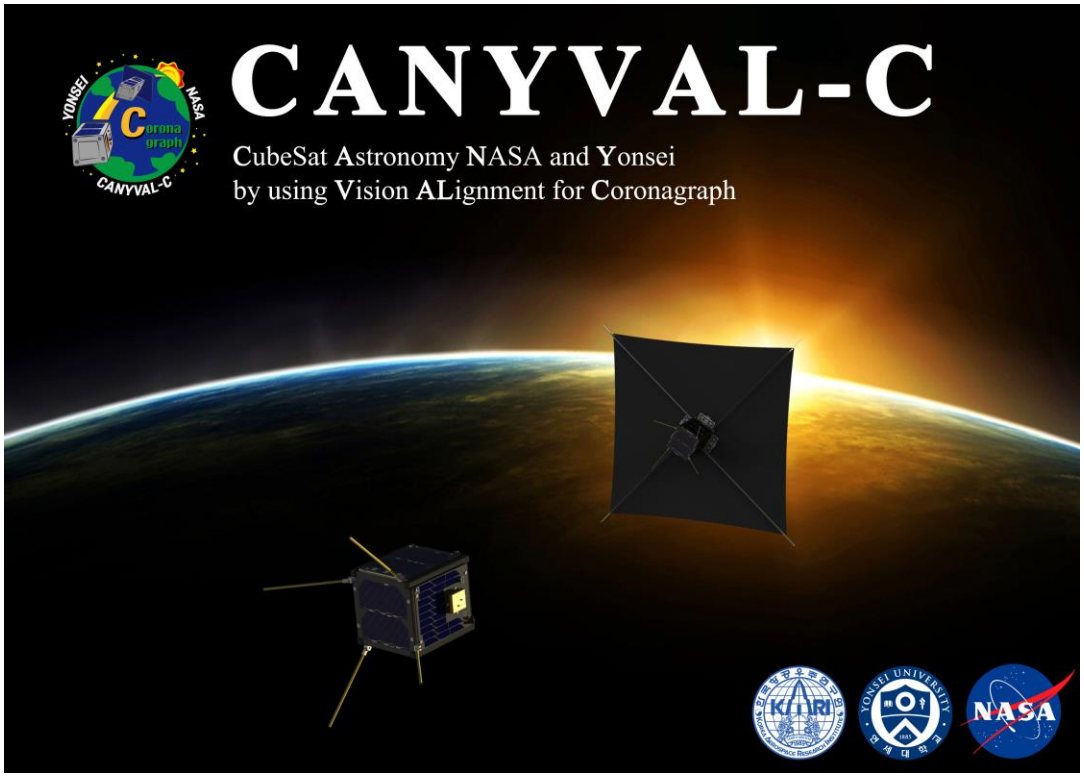
- FORMATION FLYING TECHNICAL DEMONSTRATION MISSION FOR VIRTUAL TELESCOPE
- 2U, 1U
- LAUNCHED: 2020-01-12

Yonsei University

Department of Satellite Systems

CUBESAT ASTRONOMY BY NASA AND YONSEI USING VIRTUAL TELESCOPE ALIGNMENT FOR CORONAGRAPH (CANYVAL-C)

- FORMATION FLYING TECHNICAL DEMONSTRATION MISSION FOR VIRTUAL TELESCOPE
- 2U, 1U
- LAUNCHED: 2021-03-22

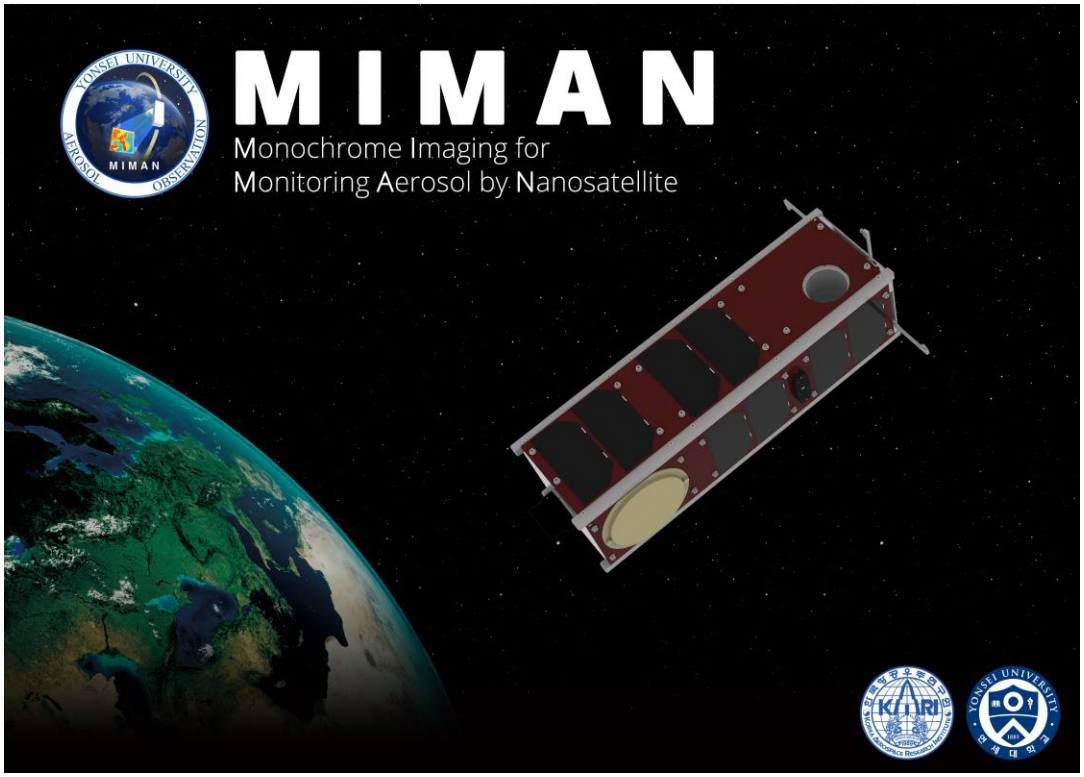


Yonsei University

Department of Satellite Systems

MONOCHROME IMAGING FOR MONITORING AEROSOL BY NANOSATELLITE (MIMAN)

- MONITORING AEROSOL ON THE WEST SEA
- 3U
- LAUNCHED: 2022-06-21

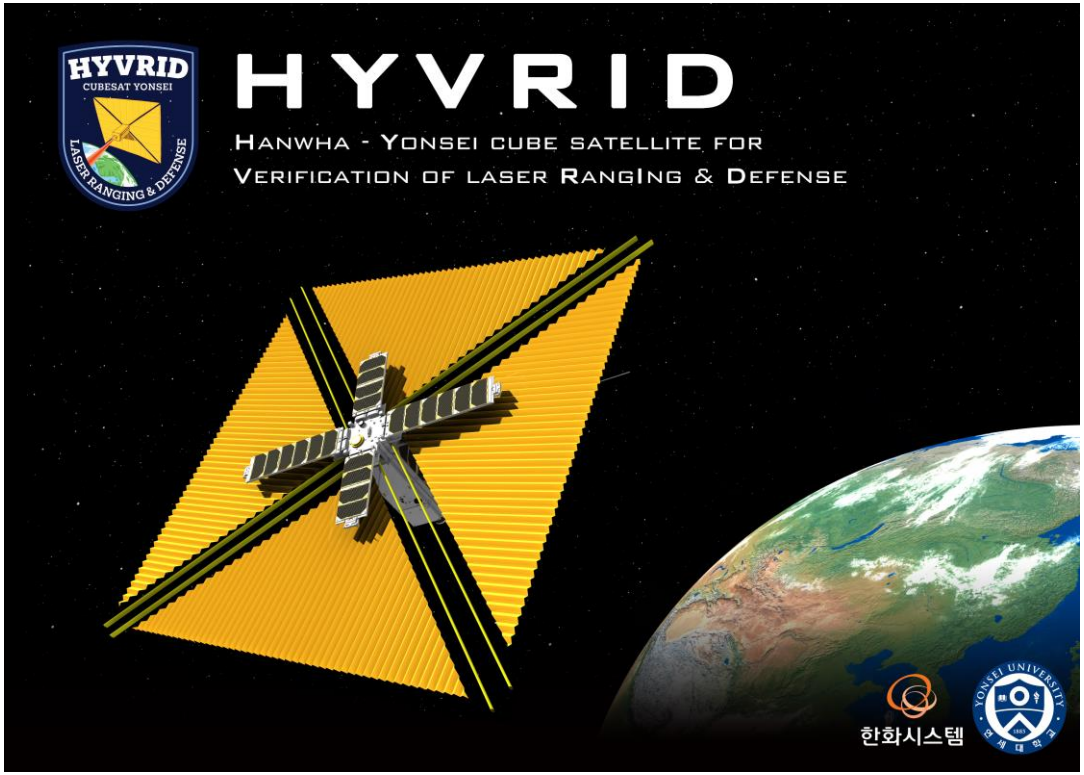


Yonsei University

Department of Satellite Systems

HANHWA-YONSEI VERIFICATION FOR LASER RANGING & DEFENSE (HYVRID)

- SATELLITE LASER RANGING VERIFICATION
- 3U
- Q1 2025

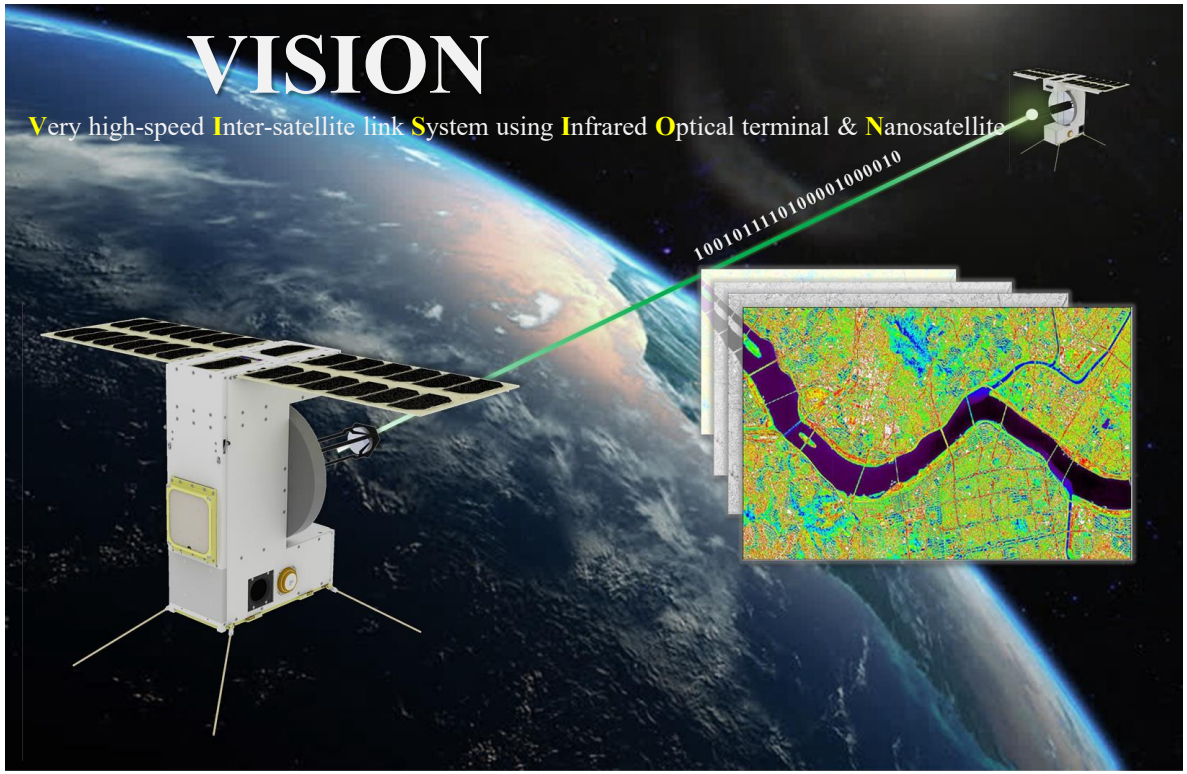


Yonsei University

Department of Satellite Systems

VERY HIGH SPEED INTER-SATELLITE LINK SYSTEM USING INFRARED OPTICAL TERMINAL & NANOSATELLITE (VISION)

- Laser communication satellite
- 6U x 2EA



Thank you for listening!