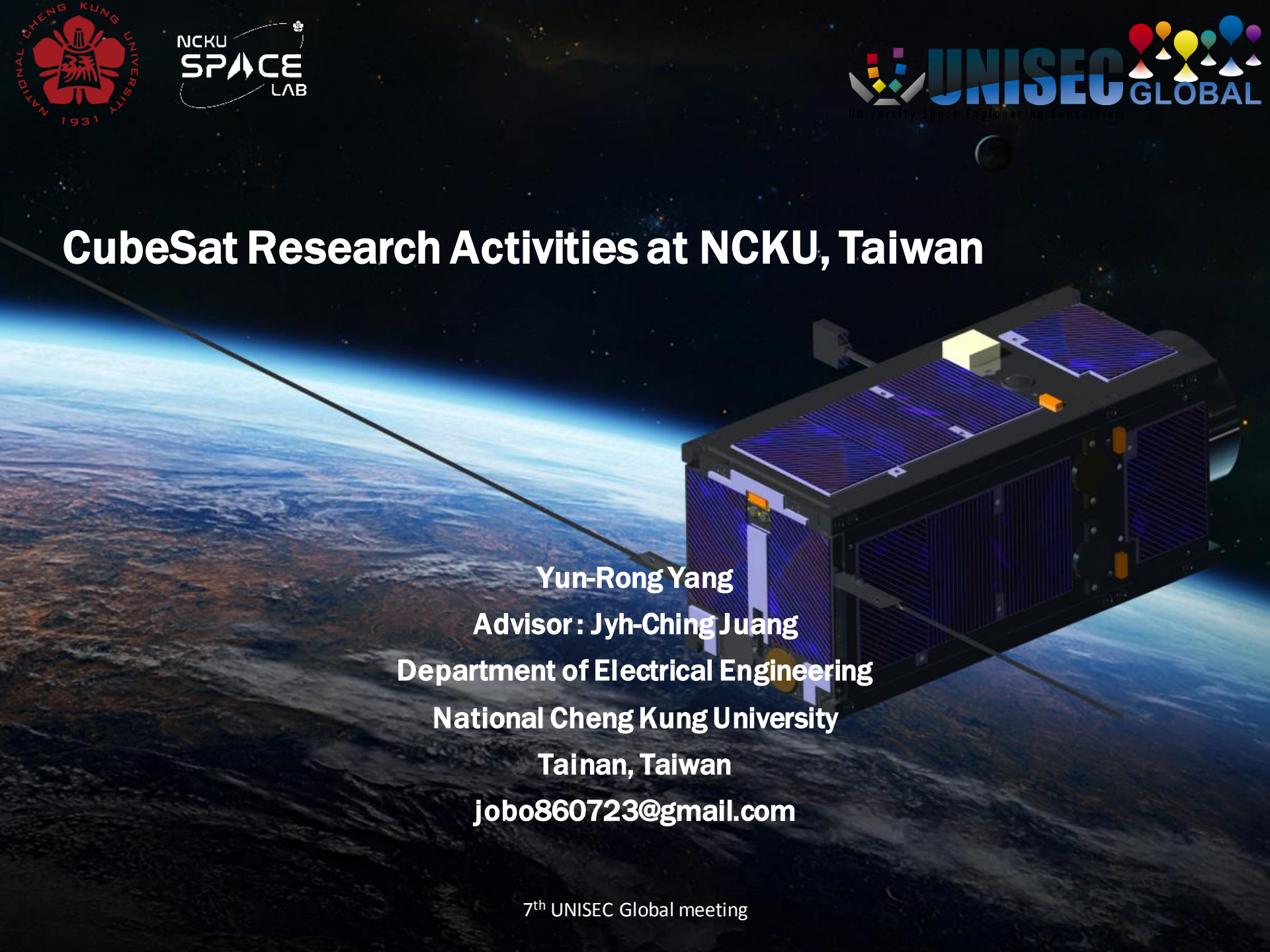
CubeSat Research Activities at NCKU, Taiwan



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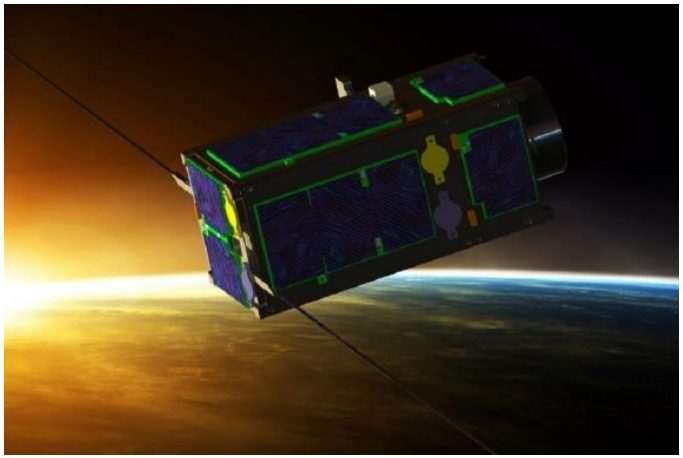
7th UNISEC Global meeting

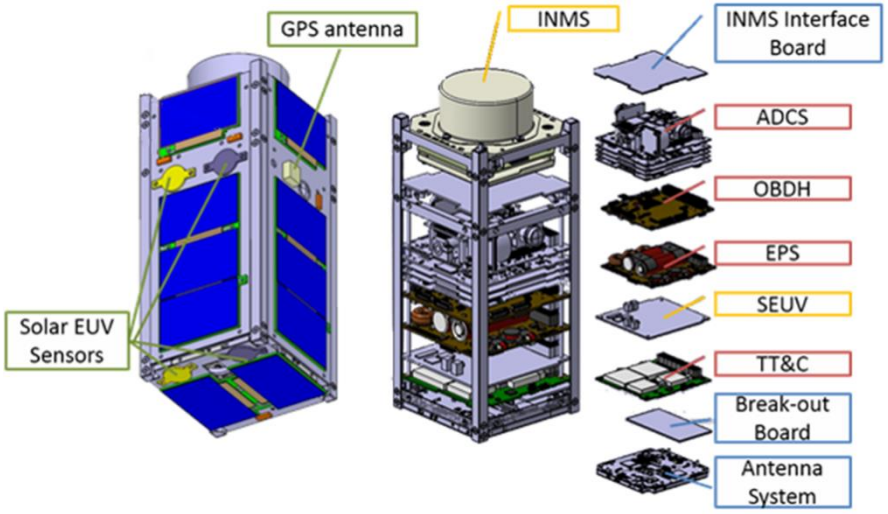
SPACE LAB

University Space Engineering Consortium

PHOENIX

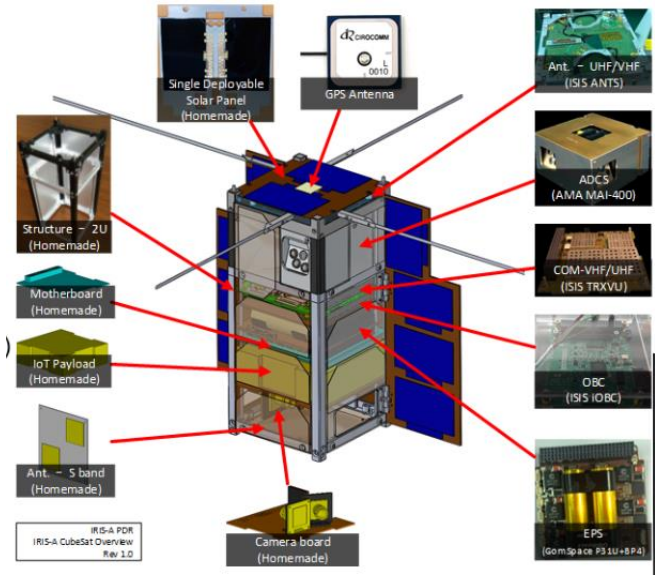
- One of the CubeSat in QB50 project.
- Deployed by ISS in middle of May in 2017.
- Scientific research

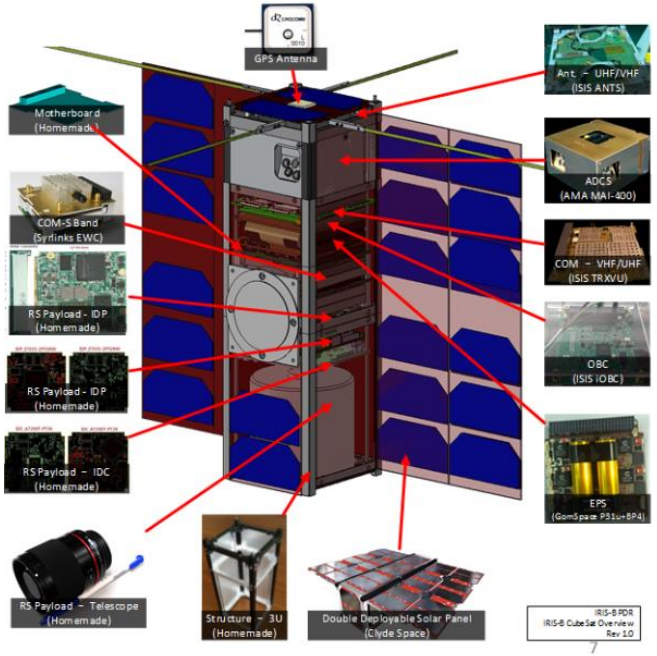




IRIS

- **Approved and funded by MOST, Taiwan in 2018**
- **Design, develop, launch, and operate two LEO CubeSat**
- **Objective :**
  - **IRIS A:** Demonstrate Internet of Things
  - **IRIS B:** Demonstrate in-orbit intelligent remote sensing technology

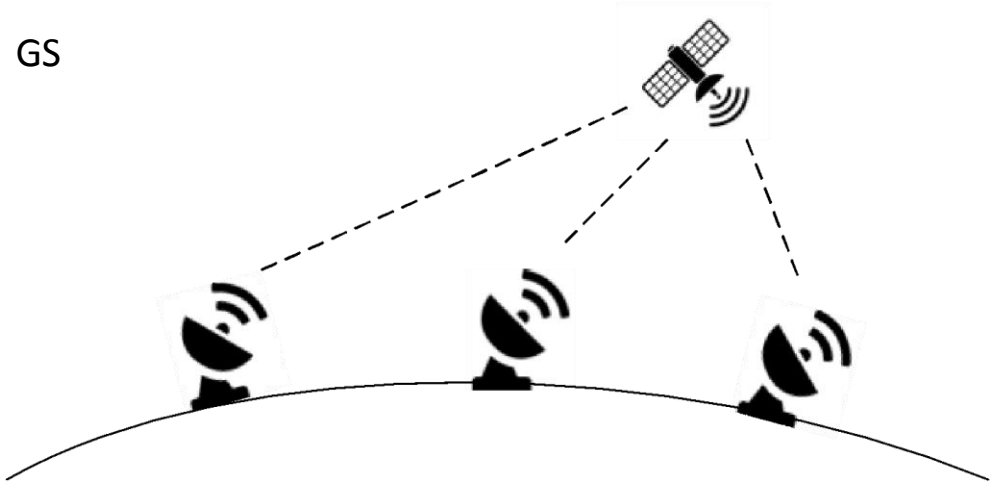




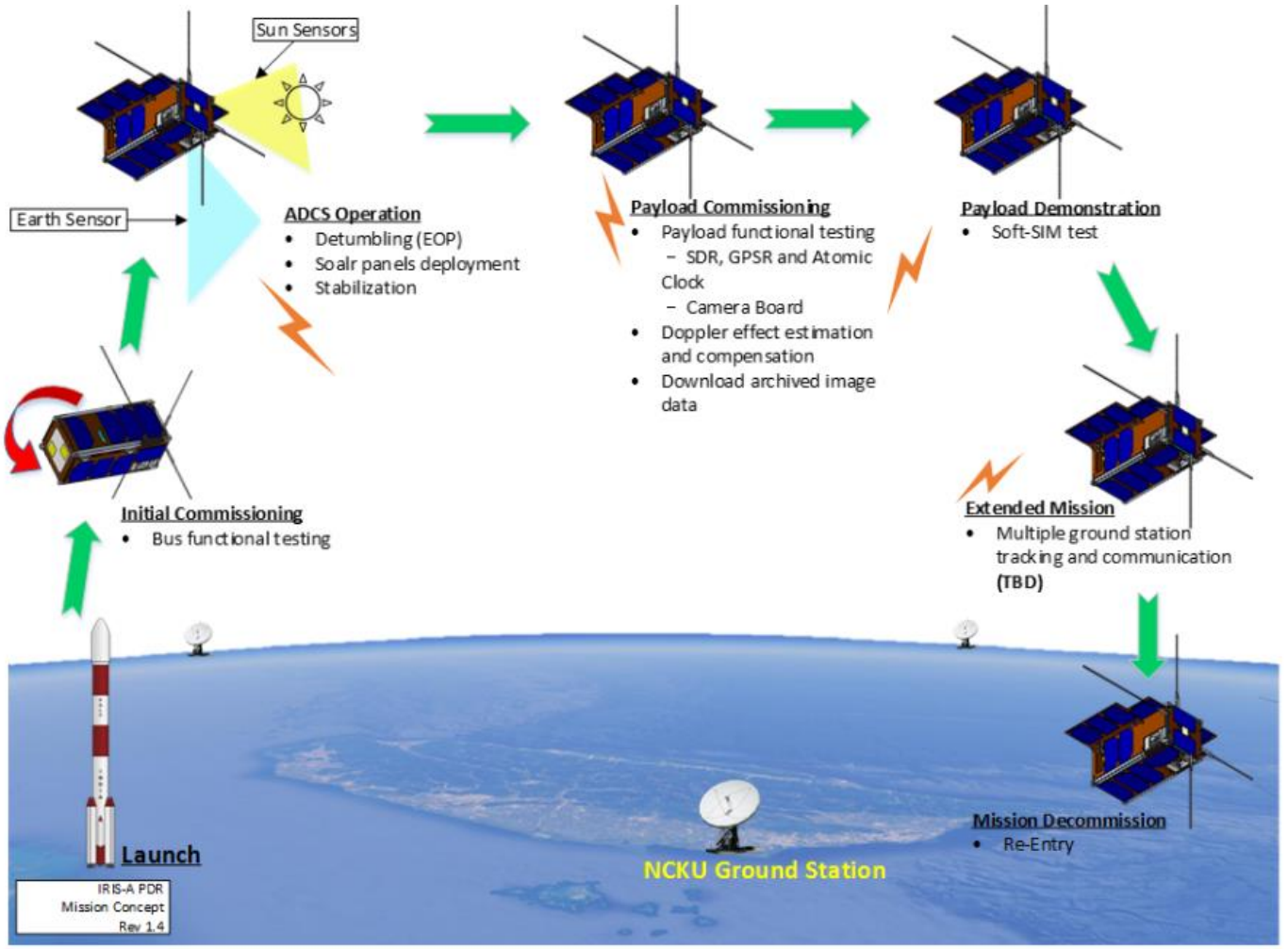
IRIS A

- Challenge
  - The **lack of frequency bandwidth** for data communication

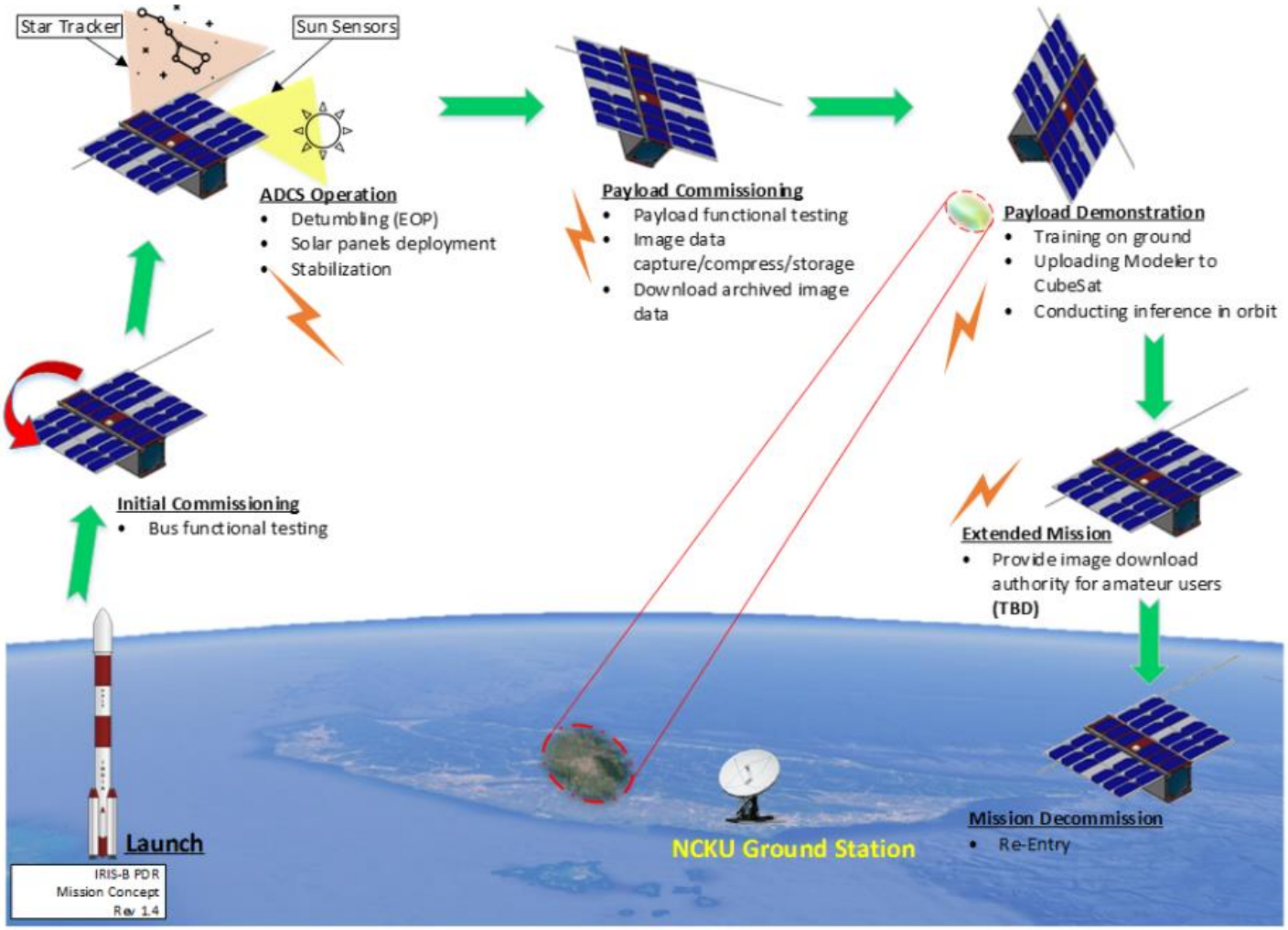
- Key feature implemented in payload
  - **Auto recognition**
    - find the registered GS by satellite itself
  - **Auto frequency allocation**
    - assigned by the connected GS
  - **Handover mechanism**
    - from one GS to another



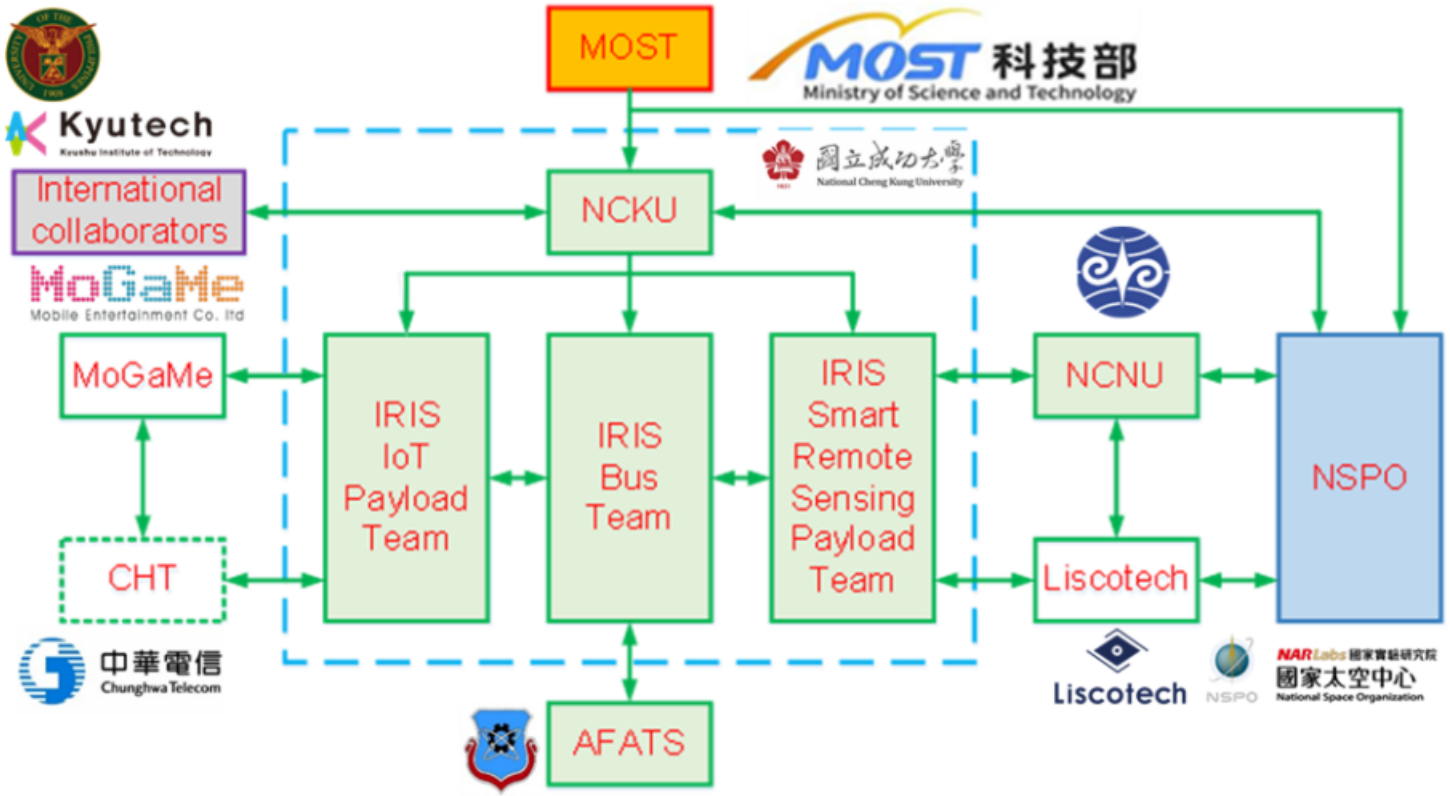
IRIS A


Sun Sensors
Earth Sensor
ADCS Operation
• Detumbling (EOP)
• Soalr panels deployment
• Stabilization
Payload Commissioning
• Payload functional testing
– SDR, GPSR and Atomic Clock
– Camera Board
• Doppler effect estimation and compensation
• Download archived image data
Payload Demonstration
• Soft-SIM test
Extended Mission
• Multiple ground station tracking and communication (TBD)
Initial Commissioning
• Bus functional testing
Launch
Mission Decommission
• Re-Entry
NCKU Ground Station
IRIS-A PDR
Mission Concept
Rev 1.4

IRIS B


Star Tracker
Sun Sensors
ADCS Operation
• Detumbling (EOP)
• Solar panels deployment
• Stabilization
Payload Commissioning
• Payload functional testing
• Image data capture/compress/storage
• Download archived image data
Payload Demonstration
• Training on ground
• Uploading Modeler to CubeSat
• Conducting inference in orbit
Initial Commissioning
• Bus functional testing
Extended Mission
• Provide image download authority for amateur users (TBD)
Launch
IRIS-B PDR
Mission Concept
Rev 1.4
NCKU Ground Station
Mission Decommission
• Re-Entry

PARTICIPANTS

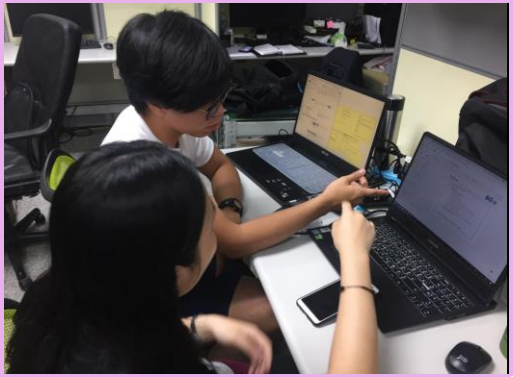


STUDENTS

Structure & Thermal

OBDH

RSI



ADCS

TT&C

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