UNISEC-TURKIYE (UZTED) 2025 Activities

Prof.Dr. Alim Rustem Aslan, UZTED President, UNISEC Global PoC and StC Member
Manager-Founder, Space Systems Design and Test Laboratory
Istanbul Technical University, Faculty of Aeronautics and Astronautics,
Istanbul, Turkey
aslanr@itu.edu.tr

ITU/FAA
Faculty of Aeronautics and Astronautics

Space Systems Design and Test Laboratory

USTTL

Prof.Dr. Alim Rüstem ASLAN

Astronautical Engineering Department
Istanbul Technical University, Turkiye
National Defense University, Turkiye

- Manager and founder, Space Systems Design and Test Laboratory
- Manager and founder , SmallSat Communication Laboratory
- International Academy of Astronautics, Member
- UZTED, President
- UNISEC-GLOBAL SC Member
- NATO CSO-STO AVT National Panel Member
- TA1ALM

Area of expertise: Design, analysis and development of pico- and nanosatellite (9 into orbit – 4 deorbited), manned and unmanned rotorcraft systems (including prototypes), computational fluid dynamics and aerodynamics, propulsion and, defense and education technologies. **Worldwide hands on cansat, cubesat and rocketry course delivery.**

CHAPTERS

UNISEC GLOBAL
University Space Engineering Consortium

UNISEC TURKIYE
University Space Engineering Consortium

UNISEC EUROPE
University Space Engineering Consortium

Established as a legal society

23 Members from

13 Universities (7 Public + 6 Private)

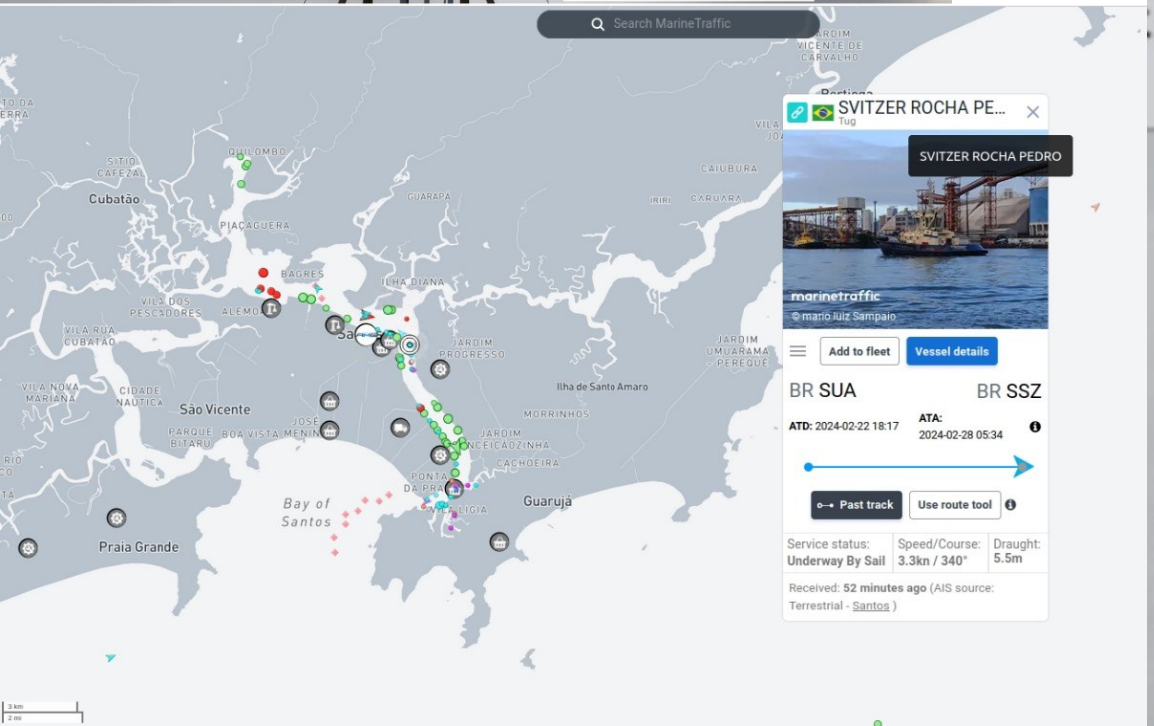
G. Assembly 19.09.2021

18.01.2023

Activities Dec 2024-Nov2025

- *UZTED Meetings*
- *UG VIRTUAL MEETINGS and IoT Project*
- *13th NSAT and 10th UNISEC GLOBAL MEETING 2024*
- *Model Satellite training for regional students, Capacity Building*
- *Space talks to Secondary schools, Institutions (Space week)*
- *MIC9 (METU)*
- *TEKNOFEST 2025 CONTEST*
- *4th ICESCO CanSat WS and AEROSPACE SYMP., Sept 6-10 2025 (Prof. Nakasuka KN)*
- *PAUSAT1 Project (Launched 14 Jan 2025)*
- *TUA RAFS Project (Launch June 2026)*
- *SHARJAHSAT1 (launch Jan 2023) operations*
- *Kılıçsat Project operations (THK)*
- *RAST2026 ISTANBUL*
- *IAC2026 Antalya – IAC2025 SYDNEY*

THK UNIVERSITY ANKARA



METU Aerospace Engineering Department

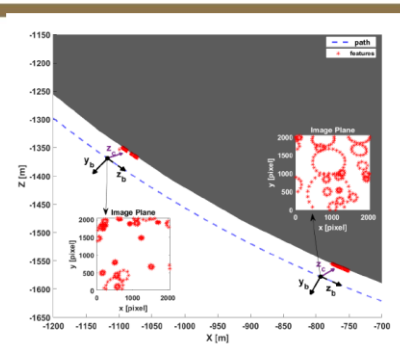
- Founded in 1981 (as aeronautical eng)
- More than 600 students (BS + MS + PhD)
- Fully Accredited by ABET
- Space related undergraduate courses
  - Introduction to Aerospace Engineering (1st year)
  - Space Vehicle Design (4th year)
  - Spacecraft Dynamics (4th year)
  - Introduction to Rocket Technology (4th year)
  - Inertial Navigation Systems (4th year)
  - Introduction to Space Sciences (Graduate)
  - Applied Orbital Mechanics (Graduate)
- Close collaboration with the Aerospace Companies and also the research institutes in Ankara.
  - Candidate Engineering for 4th year undergrad students.
  - Summer training programs

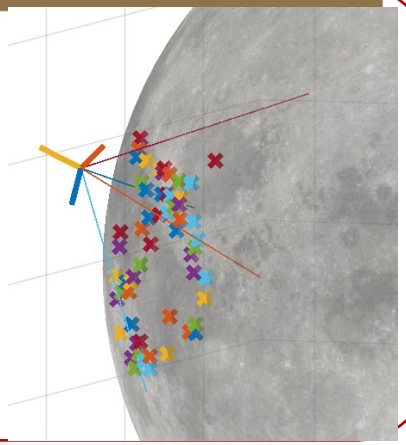
METU | FACULTY OF ENGINEERING
AEROSPACE ENGINEERING DEPARTMENT

METU

Present Activities

- METU Autonomous Space Vehicles Lab
  - Forming our own lab.
  - Working in collaboration with other departments such as METU EE.
- Students taking part in activities by
  - TUBITAK Space (Lunar program)
  - Private companies (Plan-S, Hello Space)
- APSCO Cubesat Projects
  - An engineering model for a 3U cubesat for disaster monitoring (METUCube) is currently being developed.
  - A joint cubesat constellation project is under preparation.
- International / national research projects
  - Space situational awareness
  - Fault tolerant ADCS design and development
  - Visual navigation algorithms for interplanetary missions
- Outreach activities
  - Space workshop for junior high school students
  - Science talks





Research outcomes for visual navigation aid for a lunar lander

Students contributed to the development of pocketqube satellites by Hello Space

Kids designing their cubesat missions and preparing paper mock-ups

ITU, Astronautical Engineering

- Establishment 1983 (ITU 1773)
- 50 new ug students per year + Graduate students
- Space related labs
  - Spacecraft Systems Design and Testing
  - Small Satellite communication
- Aim:
  - Research and testing on space systems and components
  - To have engineers with laboratory experience to serve the (inter)national aerospace industry

Astronautical Engineering Curriculum

- Education in space science and Technologies, 2 Space labs, 50 students/year
- Follows AIAA recomendations
- Fully Accredited by ABET till 2030
- Space related undergraduate courses (+ graduate program with advanced topics)
  - Intro. to Astronautical Engineering&Design (CanSat Application) (1st year)
  - Aerospace Materials and Structures (2nd year)
  - Orbital Mechanics, (3rd year)
  - Space environment, (3rd year)
  - Spacecraft Attitude Determination and Control (3rd)
  - Spacecraft communications (3rd)
  - Rocket and Electric Propulsion (4th)
  - Spacecraft system design with application (SSDI-II) (4th)
- Electives:
  - Basic Astronomy, Space Law, Applic.of Satellite-Based Data

İTÜ-SSDTL
Space Systems Design and Test Lab

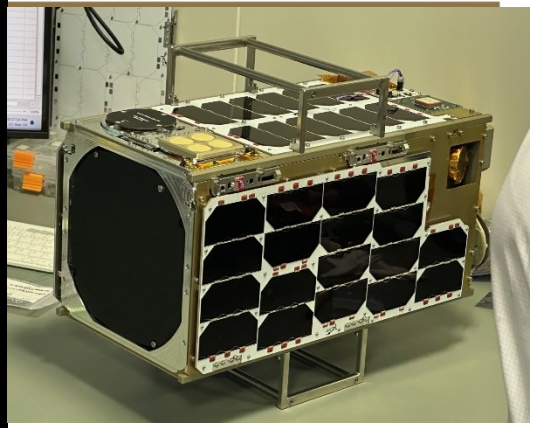
İTÜ-SSDTL CUBESAT PROJECTS

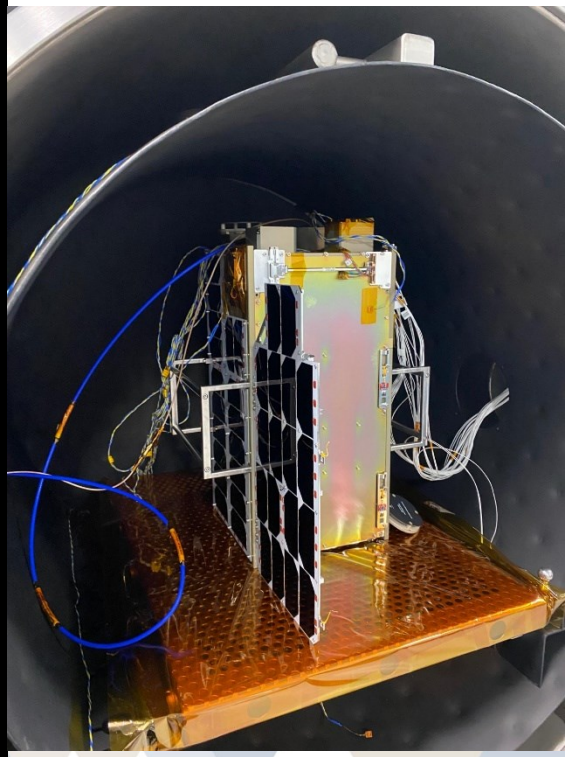
Türkiye's most satellite building & launching institution

Türkiye'nin en çok uydu yapan kurumu

İTÜ

ITU-SSDTL has completed 8 CubeSats in the lab (all launched) , and supported many others into orbit.





İSTANBUL TEKNİK ÜNİVERSİTESİ

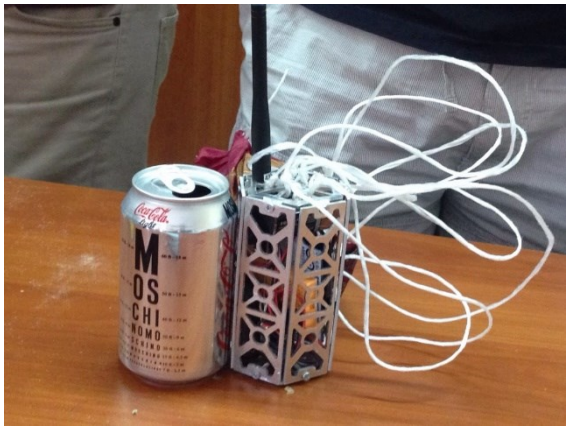
Asırlardır Çağdaş

Astronautical Engineering and Design

CANSAT(MODEL SATELLITE) DESIGN and TRAINING

2024/2025 SPRING

CanSat – Model Satellite
Intro to CanSat, Mission Definition and Sensors



Prof.Dr. Alim Rustem Aslan,
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AIAA DEEP SPACE PROJECTS for SSD COURSE

2022-2023 Project

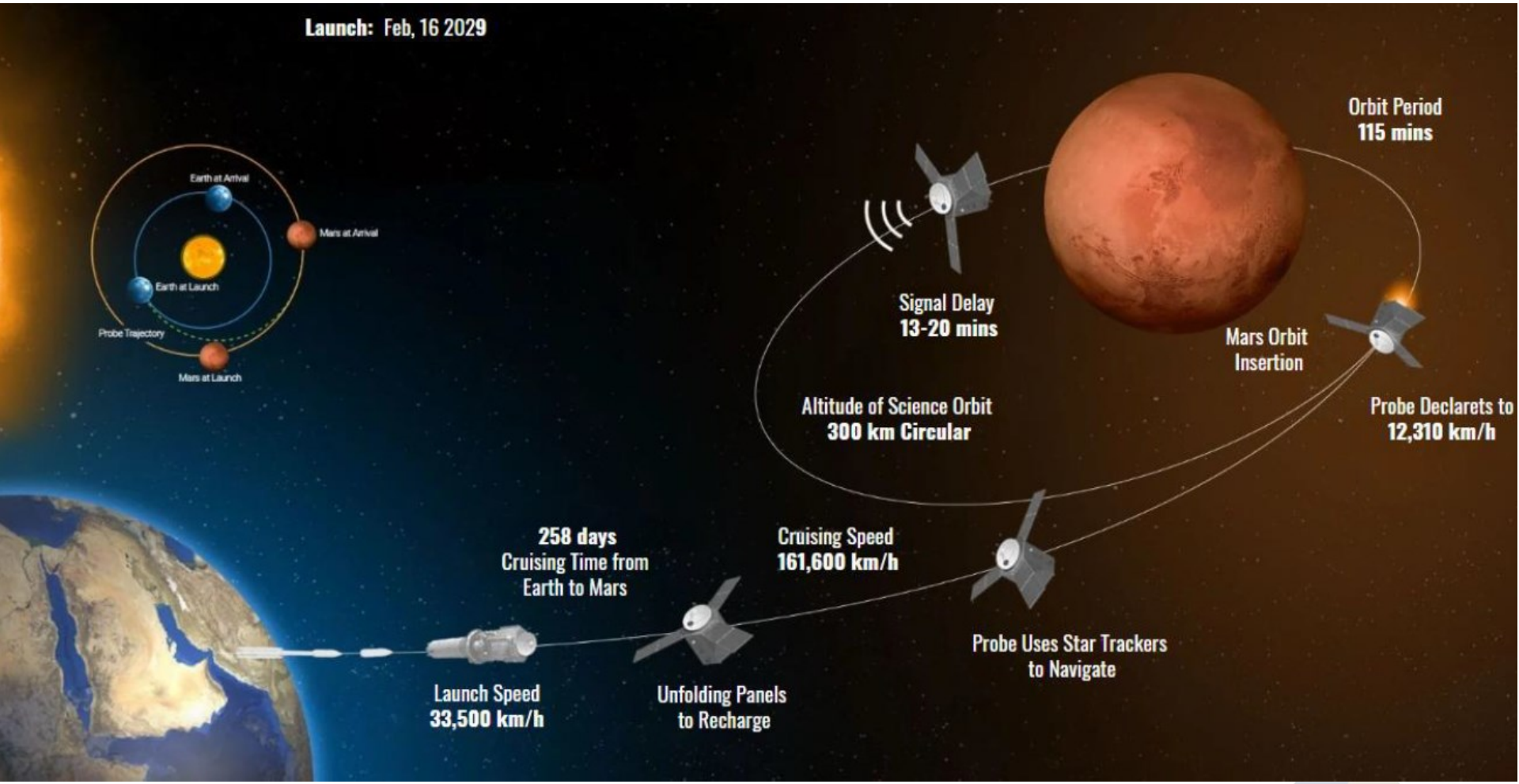
MARS DUAL ASCENT VEHICLE

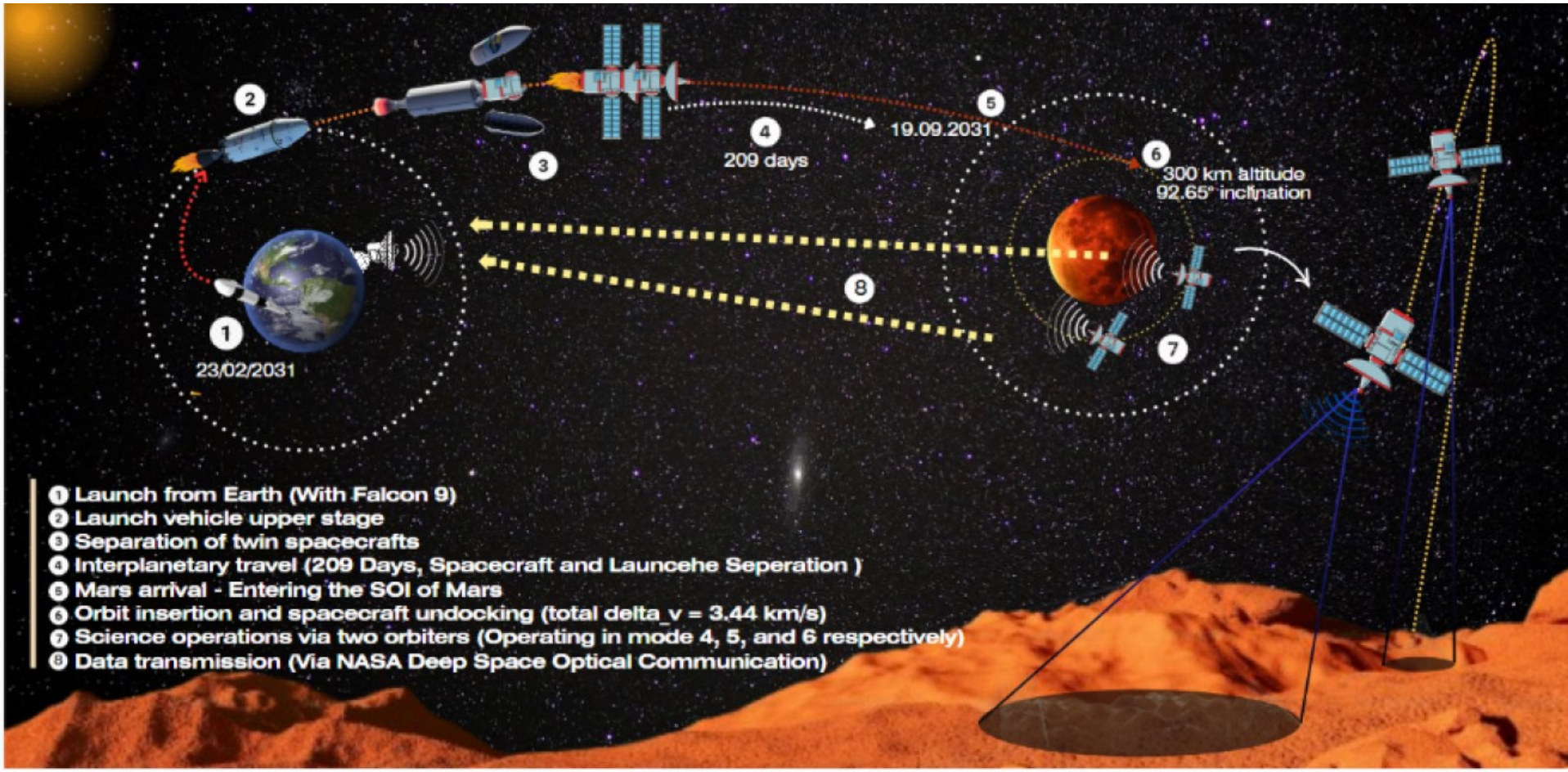
2023-2024 Project

Human Enabled Venus Robotic Exploration (AIAA 3rd Place)

2024-2025 Project

Mars Exploration Surveyors to Enable Human Exploration


Launch: Feb, 16 2029
Earth at Arrival
Mars at Arrival
Earth at Launch
Probe Trajectory
Mars at Launch
Orbit Period
115 mins
Signal Delay
13-20 mins
Mars Orbit
Insertion
Altitude of Science Orbit
300 km Circular
Probe Declarets to
12,310 km/h
258 days
Cruising Time from
Earth to Mars
Cruising Speed
161,600 km/h
Probe Uses Star Trackers
to Navigate
Launch Speed
33,500 km/h
Unfolding Panels
to Recharge


2
3
4
209 days
19.09.2031
5
6
300 km altitude
92.65° inclination
1
23/02/2031
8
7
1 Launch from Earth (With Falcon 9)
2 Launch vehicle upper stage
3 Separation of twin spacecrafts
4 Interplanetary travel (209 Days, Spacecraft and Launcehe Seperation)
5 Mars arrival - Entering the SOI of Mars
6 Orbit insertion and spacecraft undocking (total delta_v = 3.44 km/s)
7 Science operations via two orbiters (Operating in mode 4, 5, and 6 respectively)
8 Data transmission (Via NASA Deep Space Optical Communication)

TEKNOFEST '25

COMPETITION CALENDAR

TEKNOFEST
AEROSPACE AND TECHNOLOGY FESTIVAL

AUGUST

- **Yalova** August 2–3, 2025
  TEKNOFEST Drone Championship (Stage.2)
- **İstanbul** August 9–10, 2025
  5G Positioning Competition
- **Kocaeli** August 10–13, 2025
  Robotaxi Full-Scale Autonomous Vehicle Competition
- **Aksaray** August 12–14, 2025
  Model Satellite Competition Near Space Explorer Category
- **Kocaeli** August 14–15, 2025
  Turkish Natural Language Processing Competition
- **Çanakkale** August 27 – September 2, 2025
  Fighter UAV Competition
- **Kocaeli** August 24–31, 2025
  International/Inter-High School Efficiency Challenge Electric Vehicle Competition
- **Sakarya** August 25–29, 2025
  Swarm UAV Competition
- **Kocaeli** August 25–31, 2025
  Hyperloop Development Competition
- **TEKNOFEST Blue Homeland**
  August 28–31, 2025 İSTANBUL
  Unmanned Underwater Systems Competition
  Underwater Rocket Competition
  Unmanned Surface Vehicle Competition

SEPTEMBER

- **Kocaeli** September 1–3, 2025
  Quantum Technologies Competition
- **Aksaray** September 1–8, 2025
  Rocket Competition
- **İstanbul** September 2–4, 2025
  Nuclear Energy Technologies Design Competition
- **Tekirdağ** September 3–7, 2025
  Unmanned Ground Vehicle Competition
- **Çanakkale** September 3–7, 2025
  Fighter UAV Stars Competition
- **İstanbul** September 6–7, 2025
  AI-Supported Address Resolution Hackathon
- **Ankara** September 8–12, 2025
  Vertical Landing Rocket Competition
- **Kocaeli** September 8–12, 2025
  International/Inter-High School Unmanned Aerial Vehicles Competition
- **Aksaray** September 10–12, 2025
  Model Satellite Competition
- **İstanbul** September 13–14, 2025
  E-Commerce Hackathon
- **İstanbul** September 16, 2025
  Aviation Ideathon Competition

TEKNOFEST İSTANBUL September 17–21, 2025

- Biotechnology Innovation Competition
- Technology for Humanity Competition
- Barrier-Free Living Technologies Competition
- Educational Technologies Competition
- Smart Transportation Competition
- Environment and Energy Technologies Competition
- Agricultural Technologies Competition
- Technological Applications in Psychology Competition
- International Children Science Competition
- Chip Design Competition
- Artificial Intelligence in Health Competitions
- Artificial Intelligence in Aviation Competition
- Wireless Communication Competition
- Blockchain Competition
- Helicopter Design Competition
- T3 AI Hackathon
- Secure Satellite Communication Competition
- TEKNOFEST Roboleague Competition
- Financial Technologies Competition
- 3T in Oncology Competition
- TEKNOFEST Architectural and Visual Design Competition
- TEKNOFEST Vocational Skills Competition
- Air Defense Systems Competition
- Digital Technologies in Industry Competition
- World Drone Cup
- Action-Based Turkish Large Language Model Competition
- Sustainable Cities of the Future Hackathon
- ISIF
- Artificial Intelligence Movie Competition
- TEKNOFEST Drone Championship (Final Stage)

ONLINE COMPETITIONS

- *University Student Research Project Competitions*
- *High School Student Climate Change Research Project Competition*
- *High School Student Polar Research Project Competition*
- *Pardus Bug Detection and Suggestion Competition*
- *TÜBA-TEKNOFEST PhD Science Awards*


HIDROAN
6
HIDROAN
6

CANSAT/CUBESAT HANDS ON WORKSHOPS

- CANSAT/CUBESAT Design and development WORKSHOPS in
- Turkiye (many cities)
- UAE (Uo Sharjah)
- Jordan, ISNET
- Lebanon
- Sri Lanka
- Pakistan
- Morocco, ICESCO
- Egypty, NARSS
- Burkina Faso, ICESCO
- Almatı ICESCO
- ICAST 2025
- Efforts towards UN 2030 goals


ICESCO'S 4TH INTERNATIONAL
AEROSPACE SYMPOSIUM
8th September 2025
Al-Farabi University
Almaty, Kazakhstan
ICESCO
FARABI
KAZAKH NATIONAL UNIVERSITY
1934

10:50 - 11:00	*Program Overview & CanSat Initiative Briefing*	• *Presentation on ICESCO's CanSat training legacy, achievements, and vision* • *Overview of the 4th International CanSat Workshop objectives and structure* ***Dr. Muhammad sharif***
11:00 - 12:00	***Session 1: Leaders in Space Ecosystem*** *"Youth Engagement & International Cooperation in Space Science"* ***Key Note Speech:*** ***Professor Shinichi Nakasuka. (Father of CanSat)*** *Department of Aeronautics and Astronautics at the University of Tokyo*	
	Maj. Gen. Jose Vagner Vital (Retd) *Vice President, International Academy of Space Studies (IASS)* *Director of Business & Innovation, SAIPHER*	

Prof. Dr. Shinichi Nakasuka

Professor, Department of Aeronautics and Astronautics. Graduate School of Engineering, University of Tokyo


LAUNCH DAY
NASA

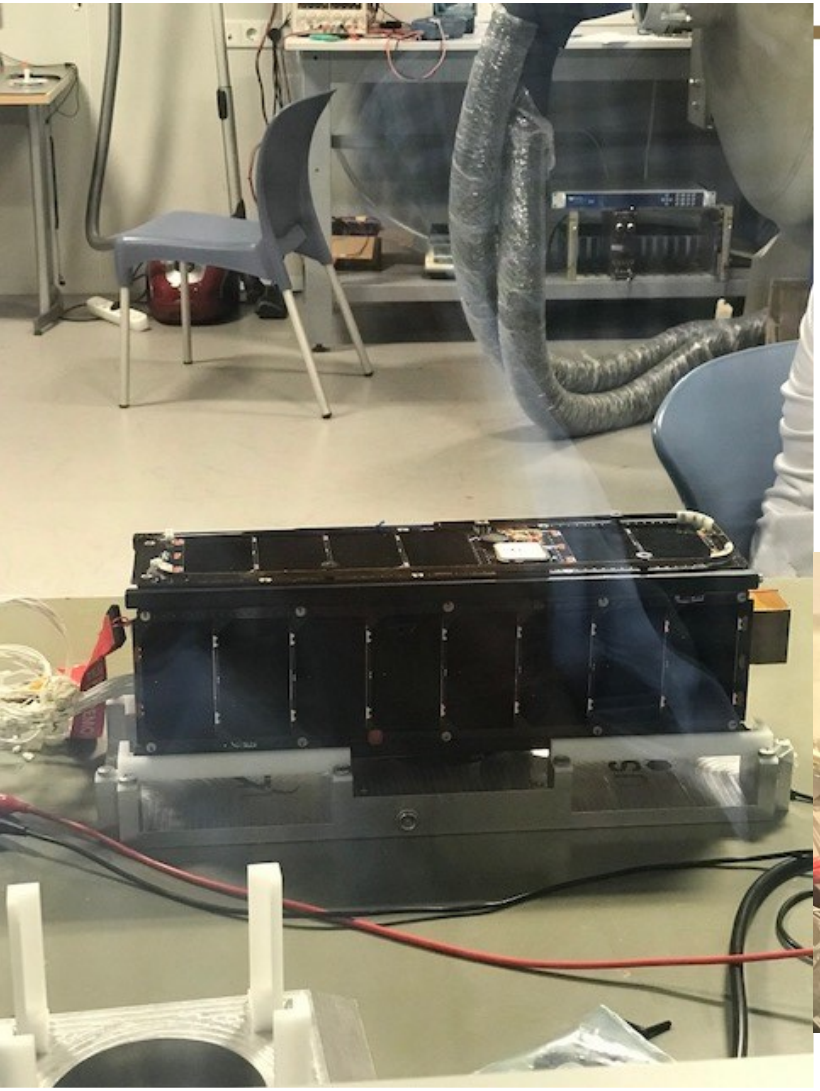
SHARJAHSAT-1 MISSION

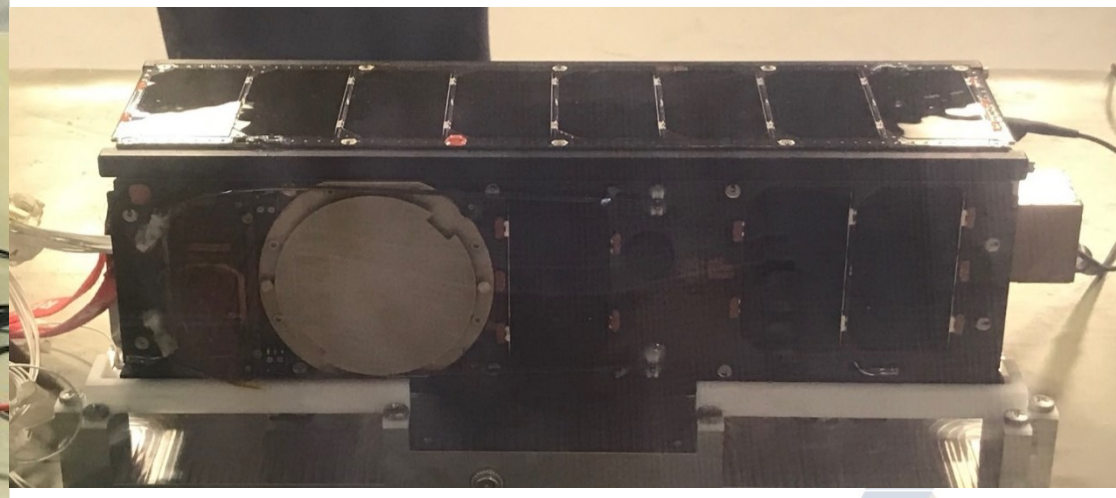
- UNIVERSITY of SHARJAH, UAE
- Istanbul Technical University
- Sabancı University

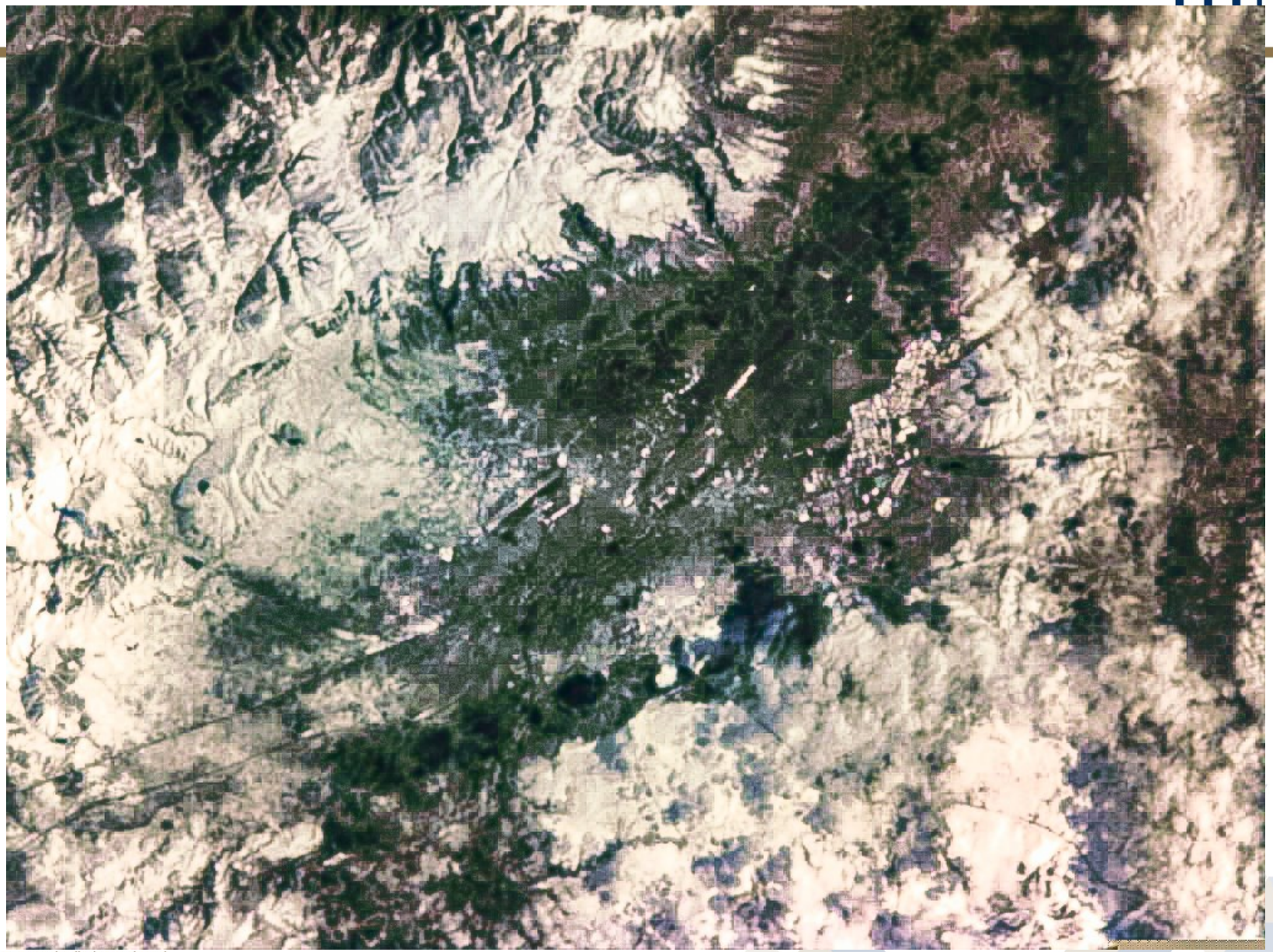
- Capacity development through
  - Science mission: star detection and sun observation
  - Imaging mission: earth and space
- Payload
  - X Ray detector
  - Optical camera

- Launched 3 January 2023

SHARJAHSAT-1 Before Flight

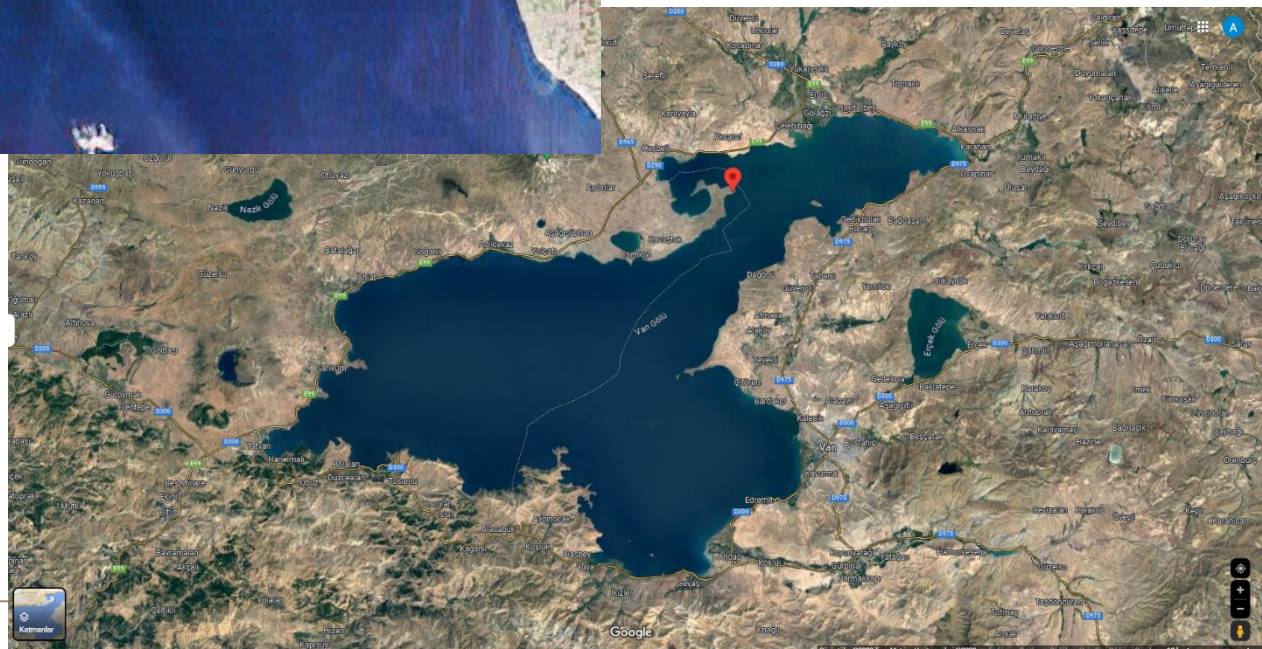




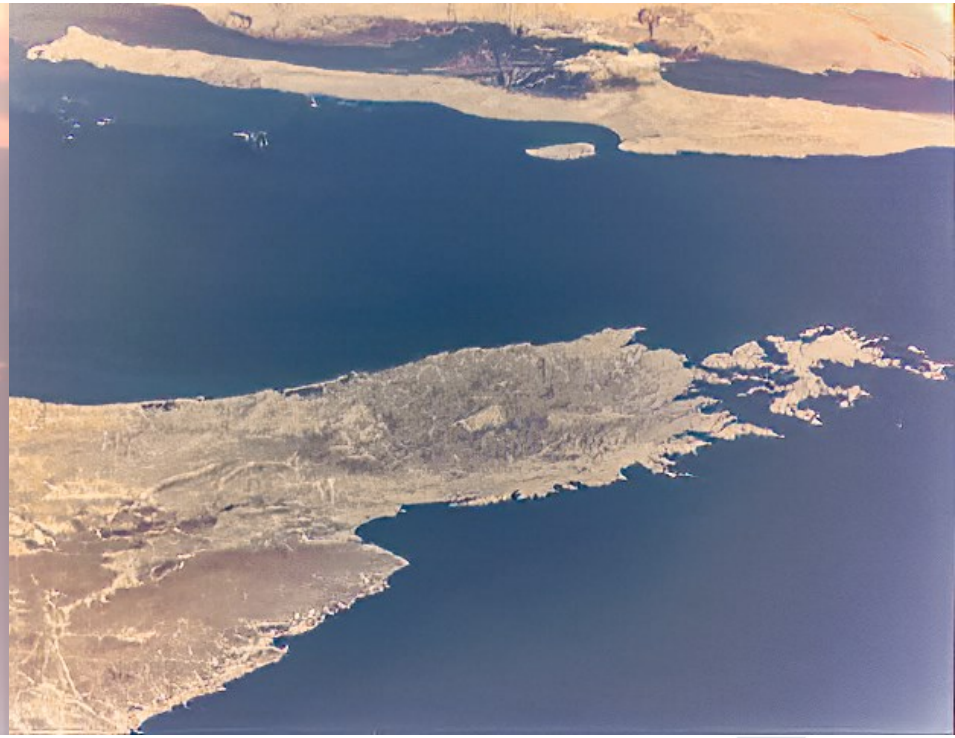


İTÜ

VAN LAKE
TURKİYE

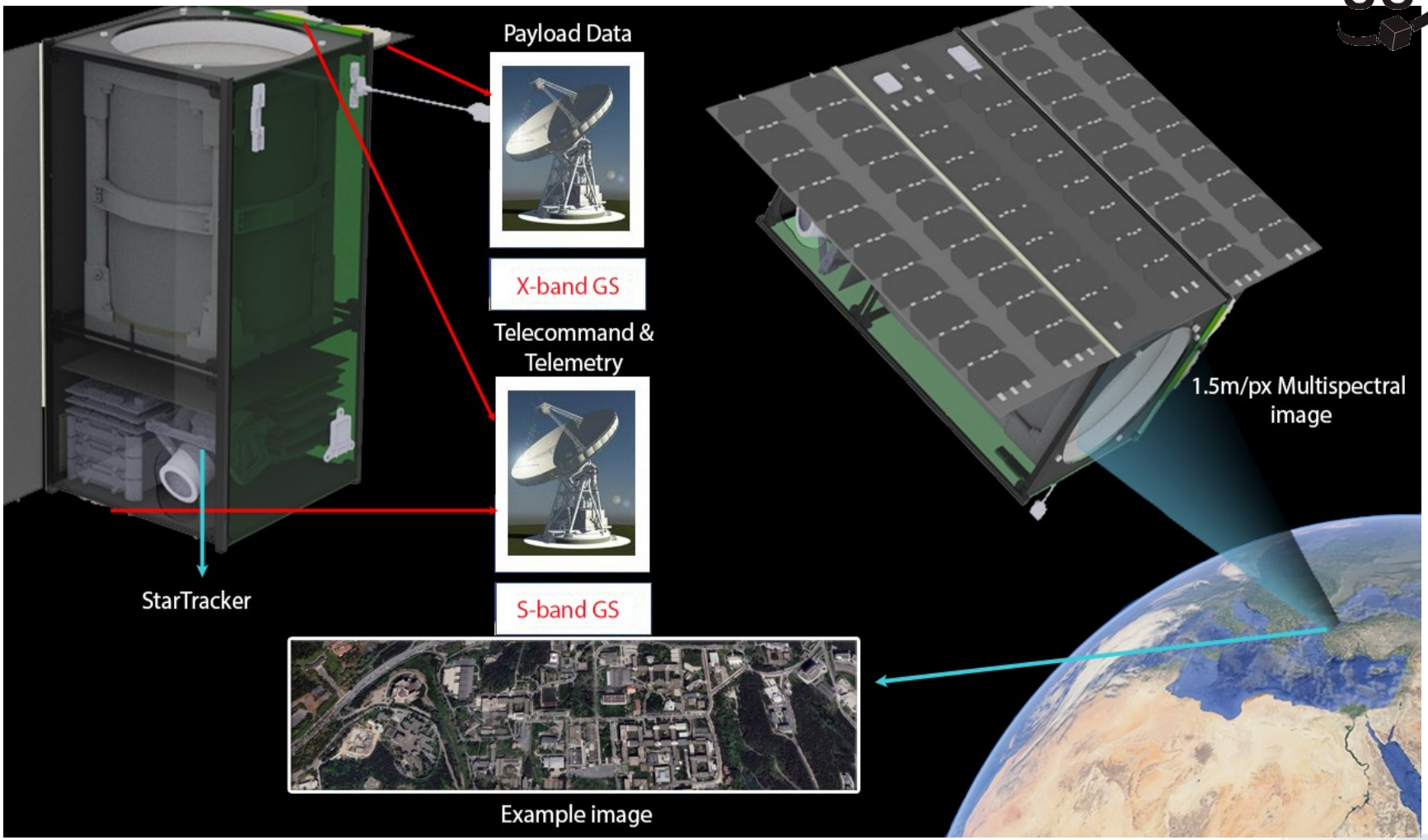


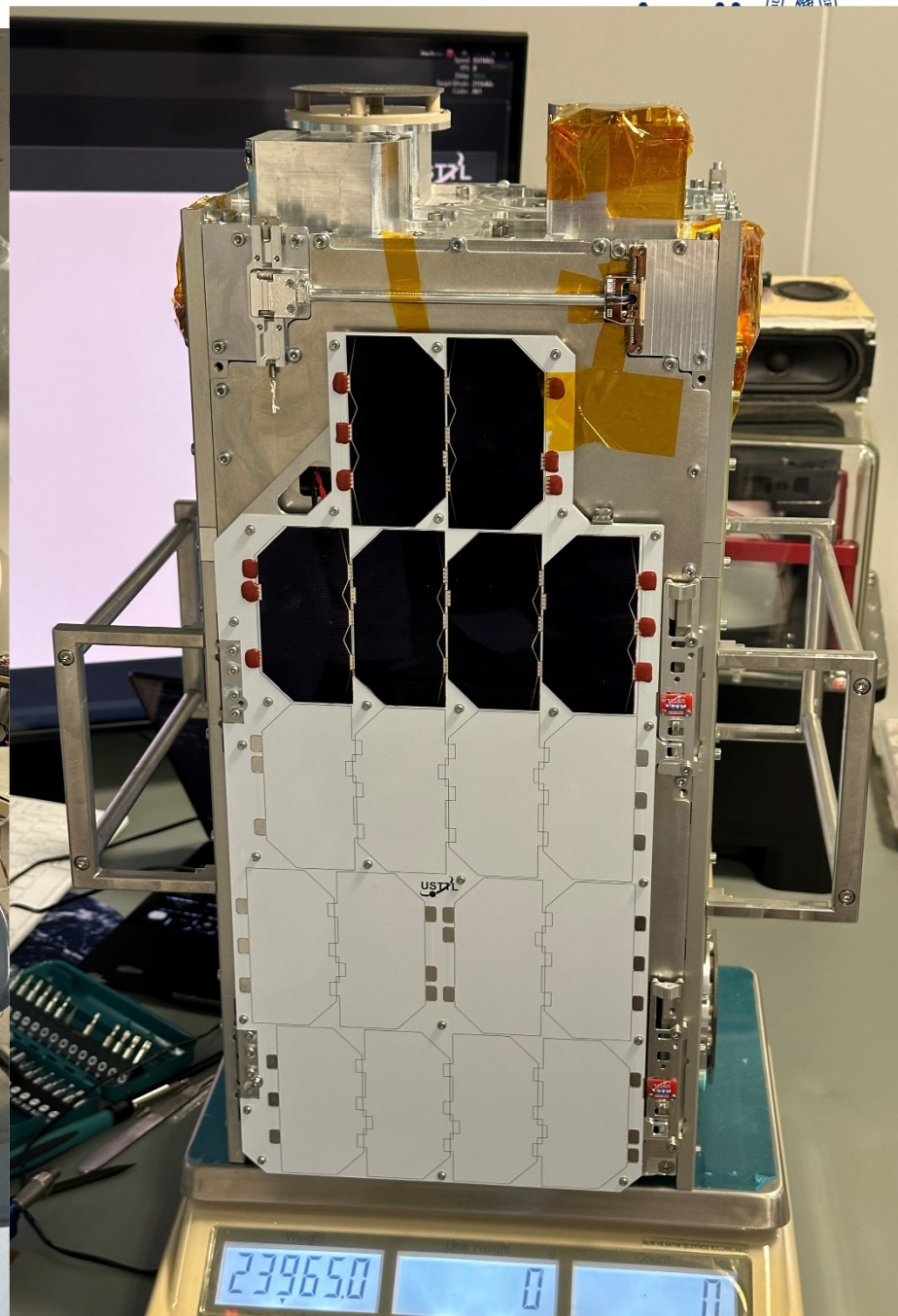
EAST UAE



ISKENDERUN BAY

PAUSAT1: 1.5 m GSD at 500 km Earth Observation Mission

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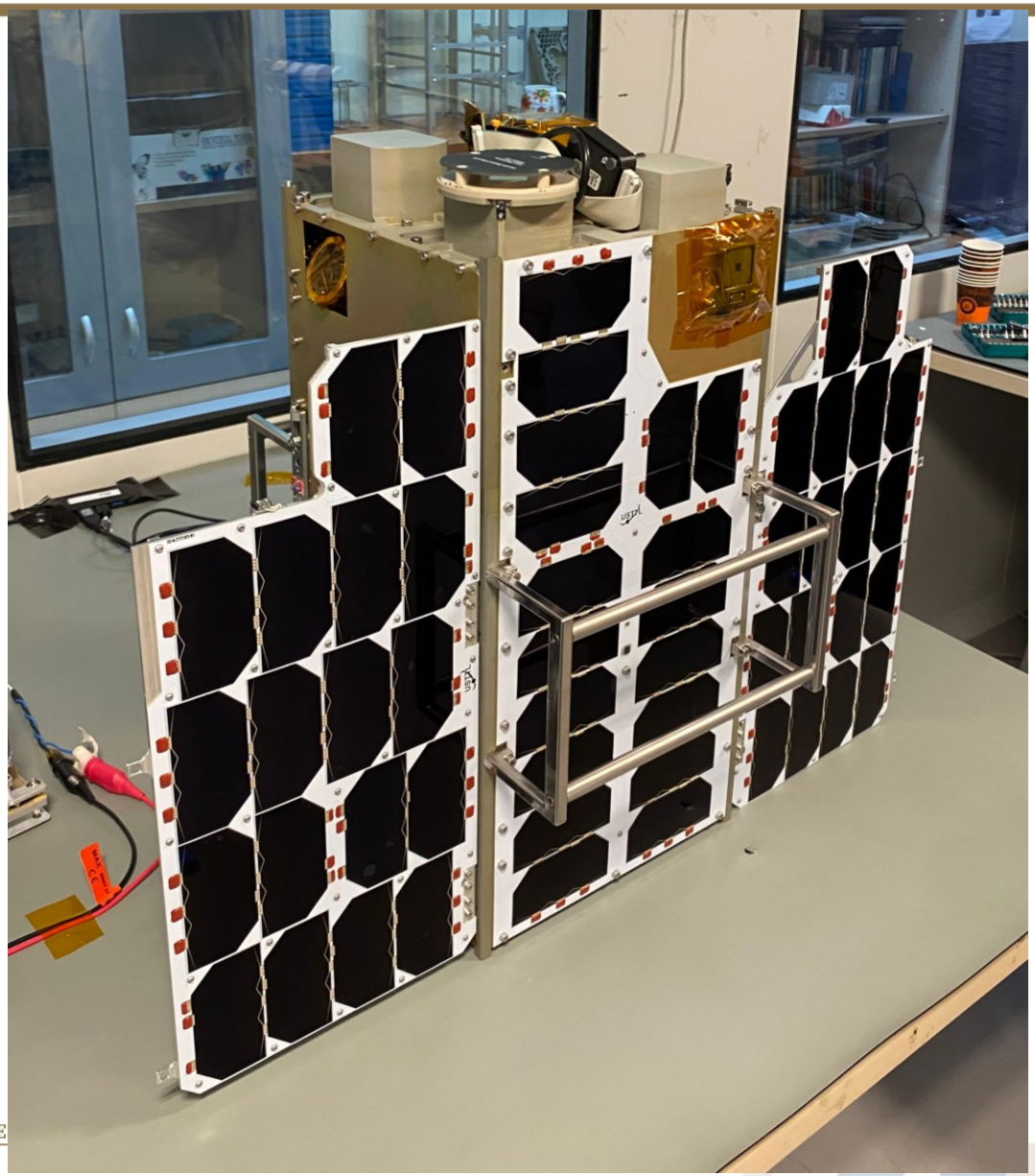
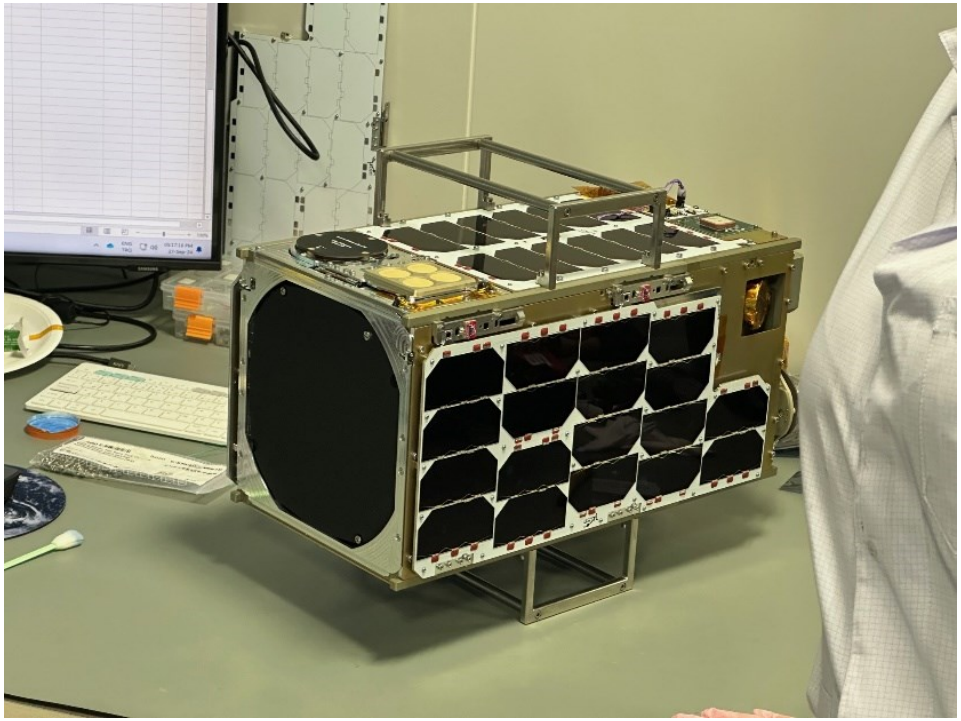


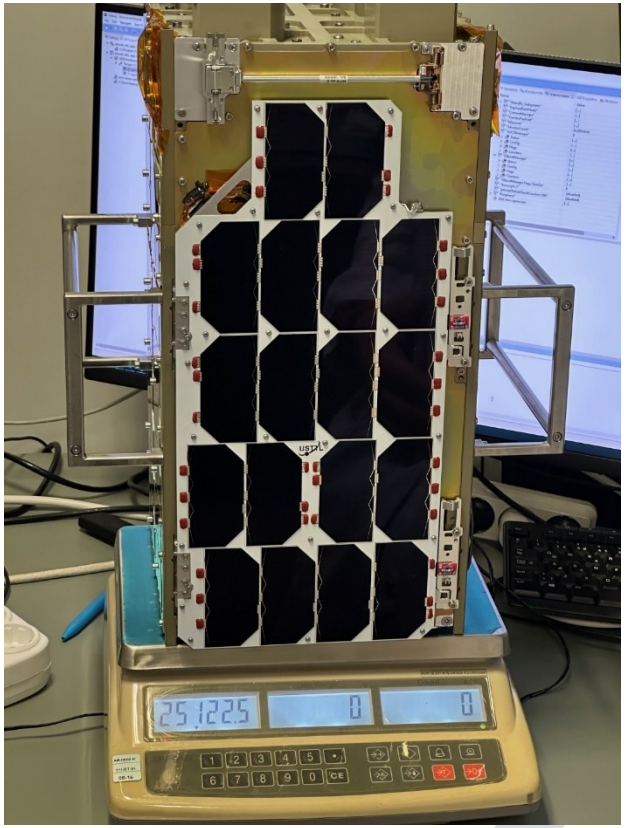
PAUSAT1

Çok Yüksek Çözünürlüklü Yer Gözlem Küp Uydusu

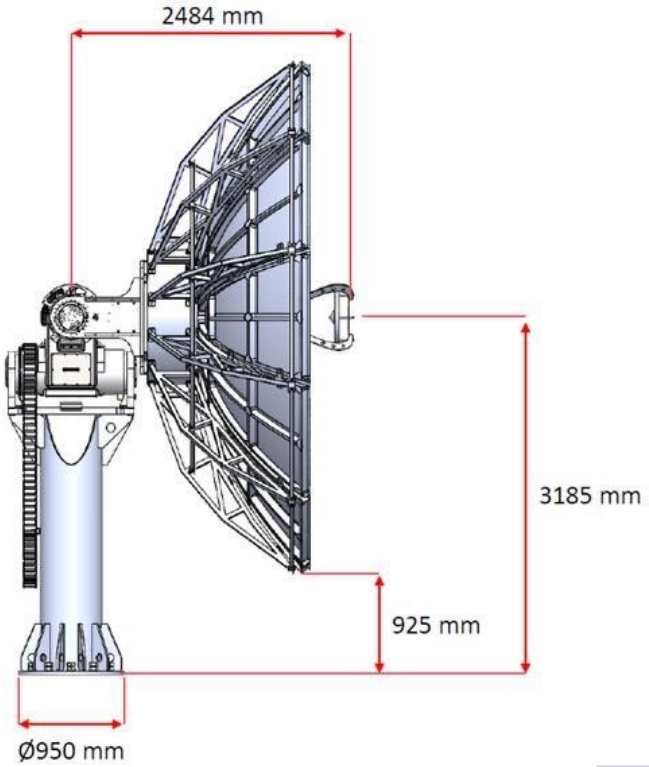
İTÜ Uzay Sistemleri Tasarım ve Test Laboratuvarı bünyesinde geliştirilmiştir.

FM-1.5 m GSD MS 16 U 25 kg

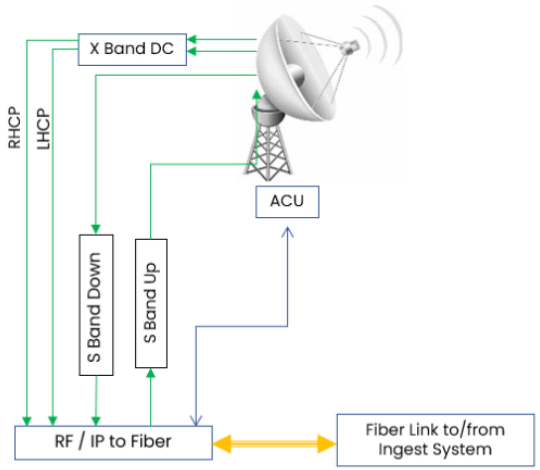




S/X BAND GS



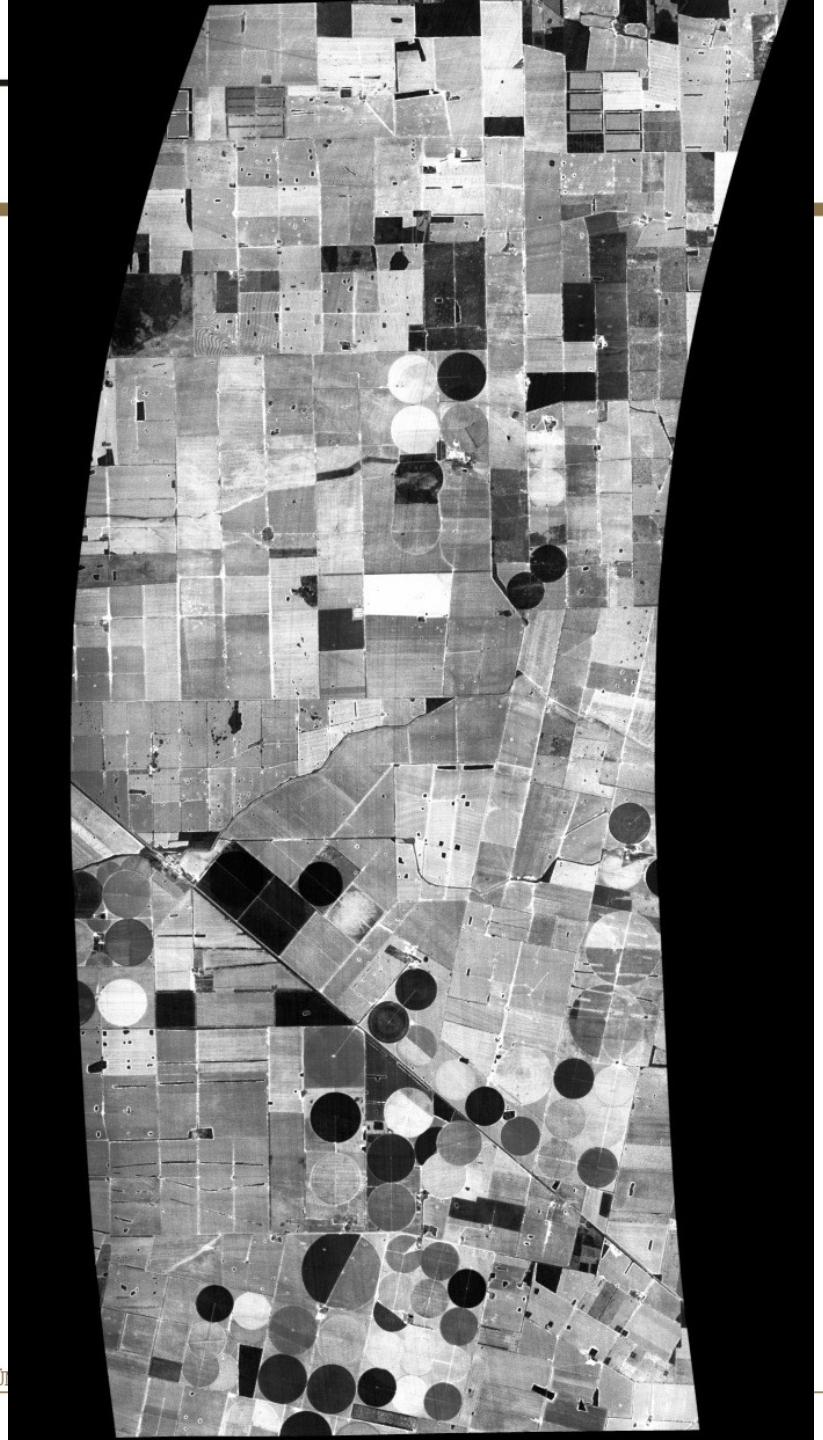
ITU-CSCRS S/X BAND Ground Station

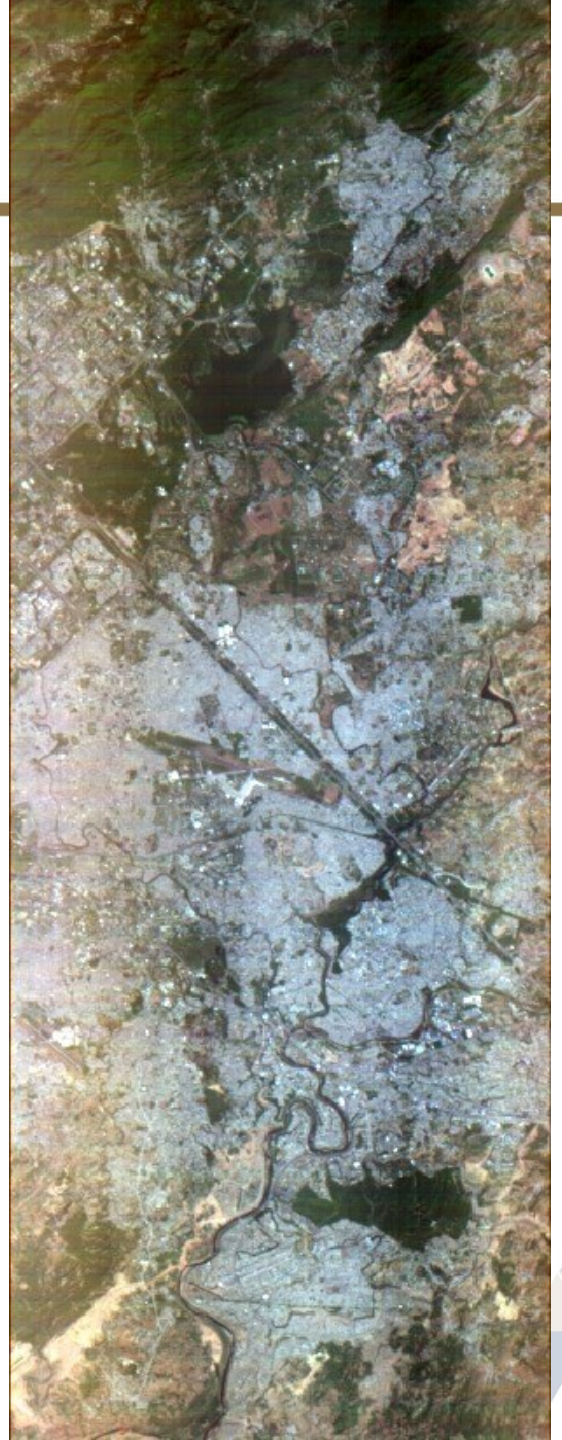


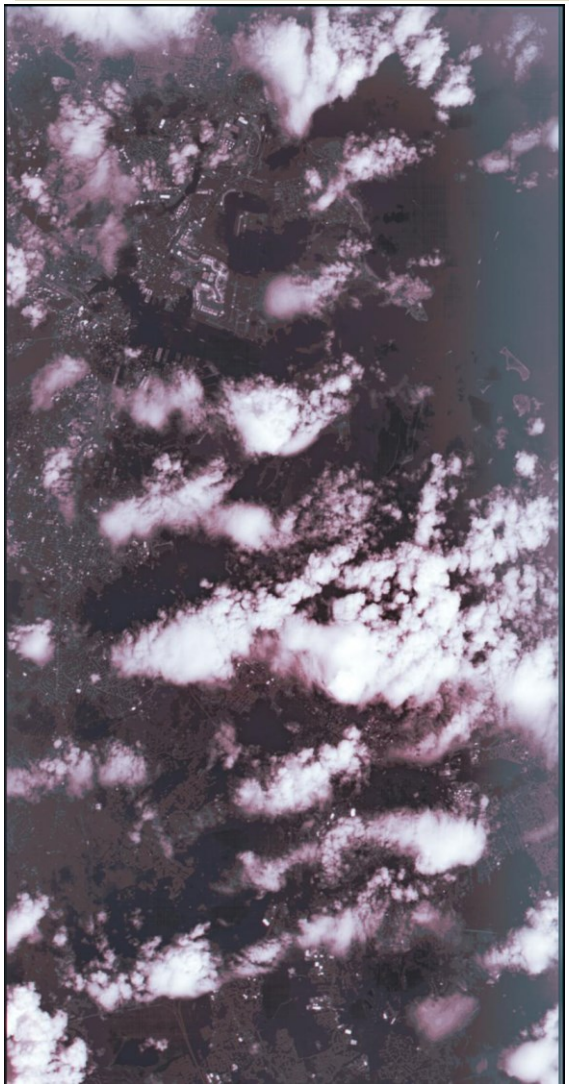
CGC 6.1m
•Type 4 Antenna 6.1m
•S-band G/T: 16dB/K Rx: 2200 – 2400 MHz
•S-band EIRP 56dBw Tx: 2025 – 2130 MHz
•S-band IF 70 MHz
•S-band LHCP or RHCP provide data output

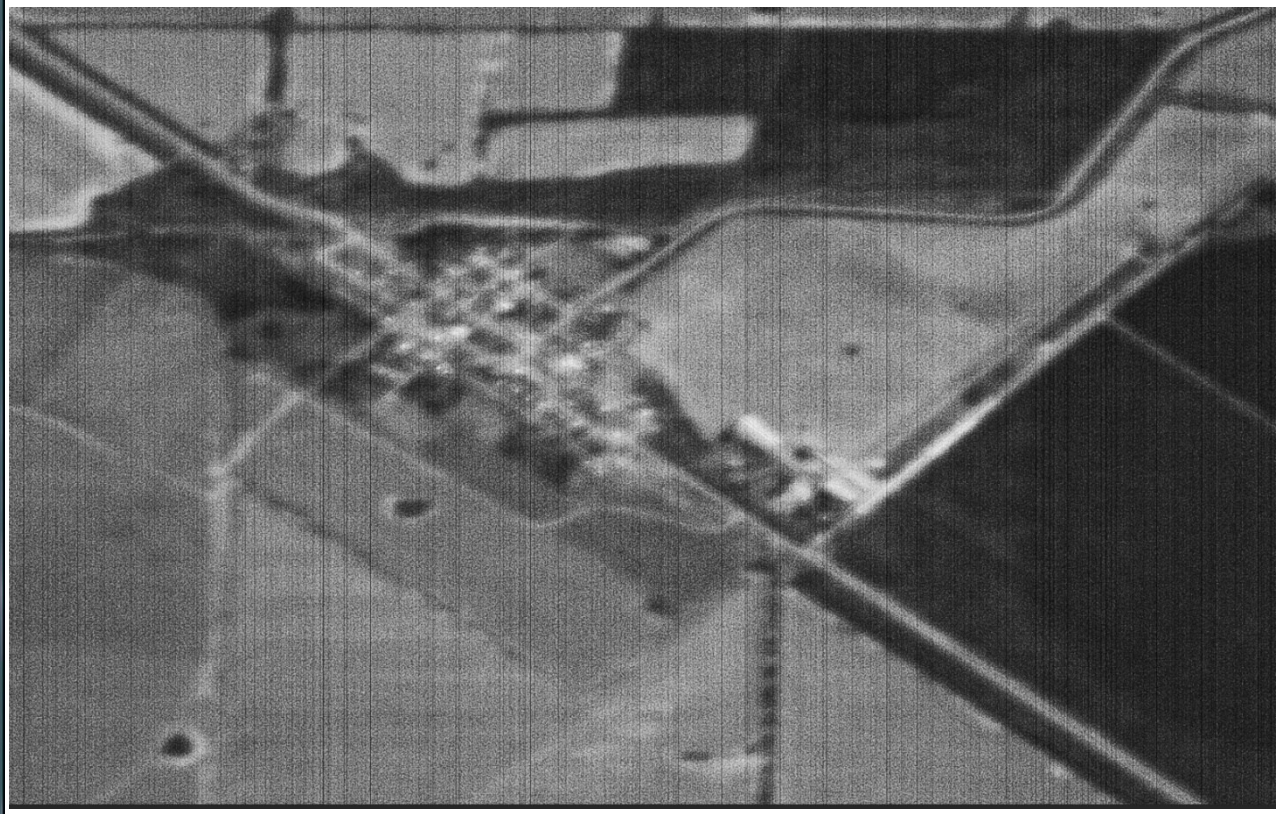
•X-band LHCP and RHCP provide data output simultaneously
•X-band G/T: 31.5dB/K Rx: 8000 – 8400 MHz
•X/Y drive configuration giving full hemispheric coverage.
•Max speed 5°/sec for both axis.
•Acceleration 10°/sec2.

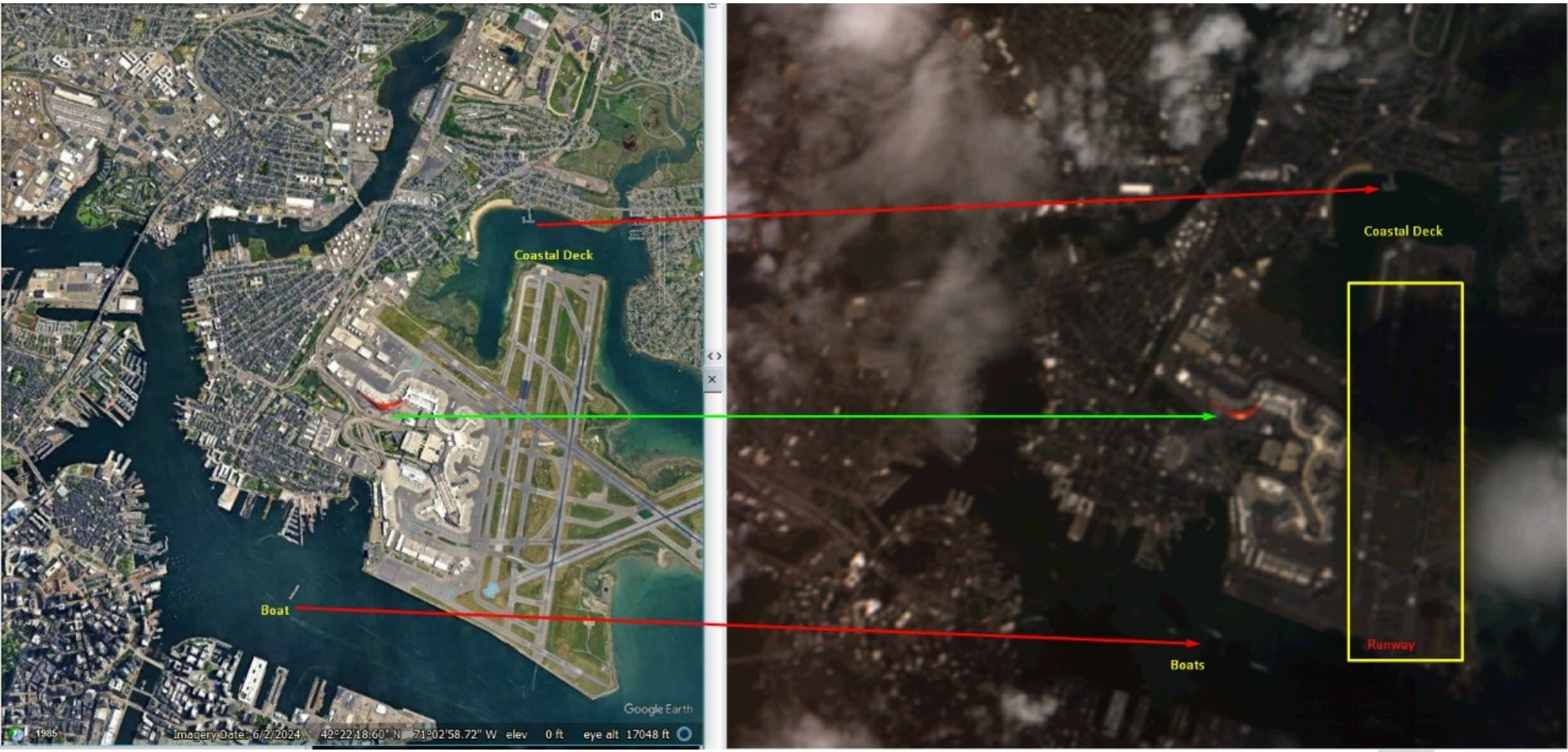
•https://web.cscrs.itu.edu.tr/homepage/
•Simultaneous S Band UL/DL and X Bant DL

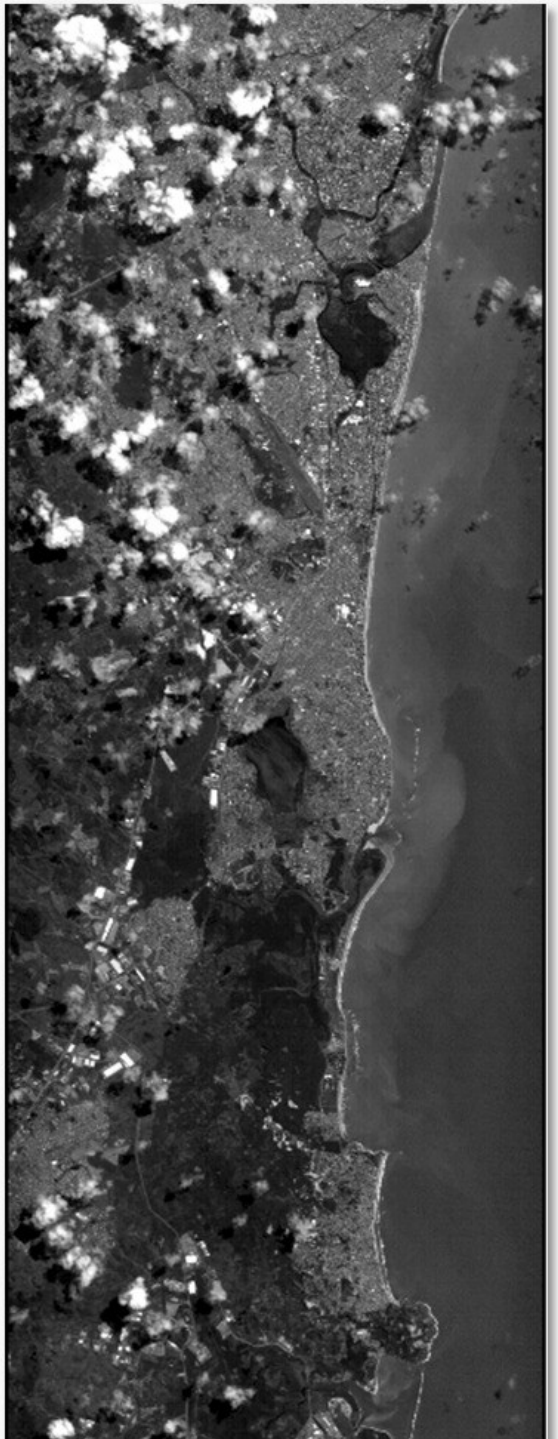




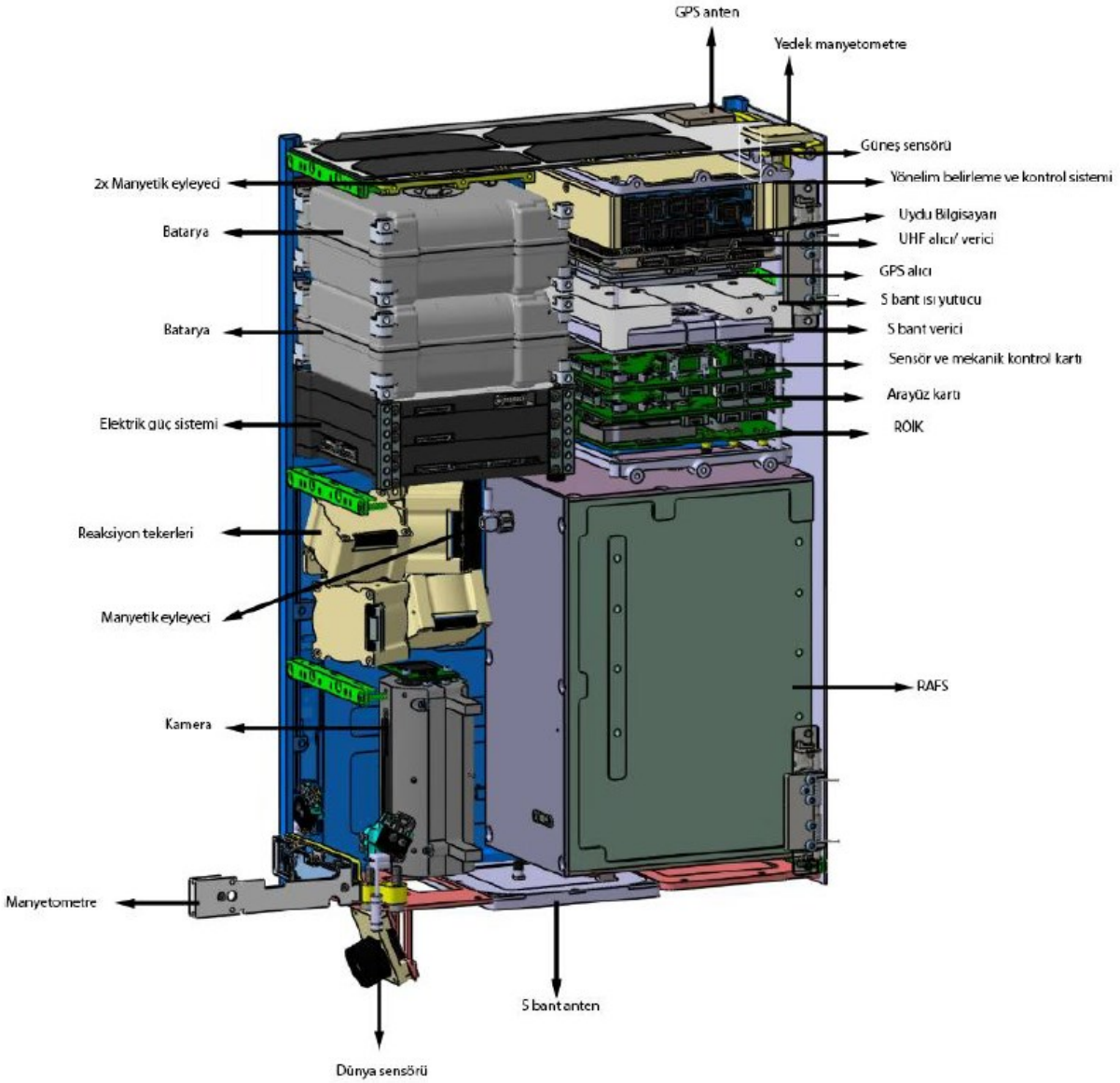





Coastal Deck
Boat
Google Earth
Imagery Date: 6/2/2024 42°22'18.60" N 71°02'58.72" W elev 0 ft eye alt 17048 ft
Coastal Deck
Runway
Boats



Rubidium Atomic Frequency Standard (RAFS) CubeSat and UHF/S GS



Rubidyum Atomik Frekans Standardı (RAFS) Görev Yüklü Küp Uydu (CubeSat) Geliştirilmesi Projesi

Türkiye Uzay Ajansı

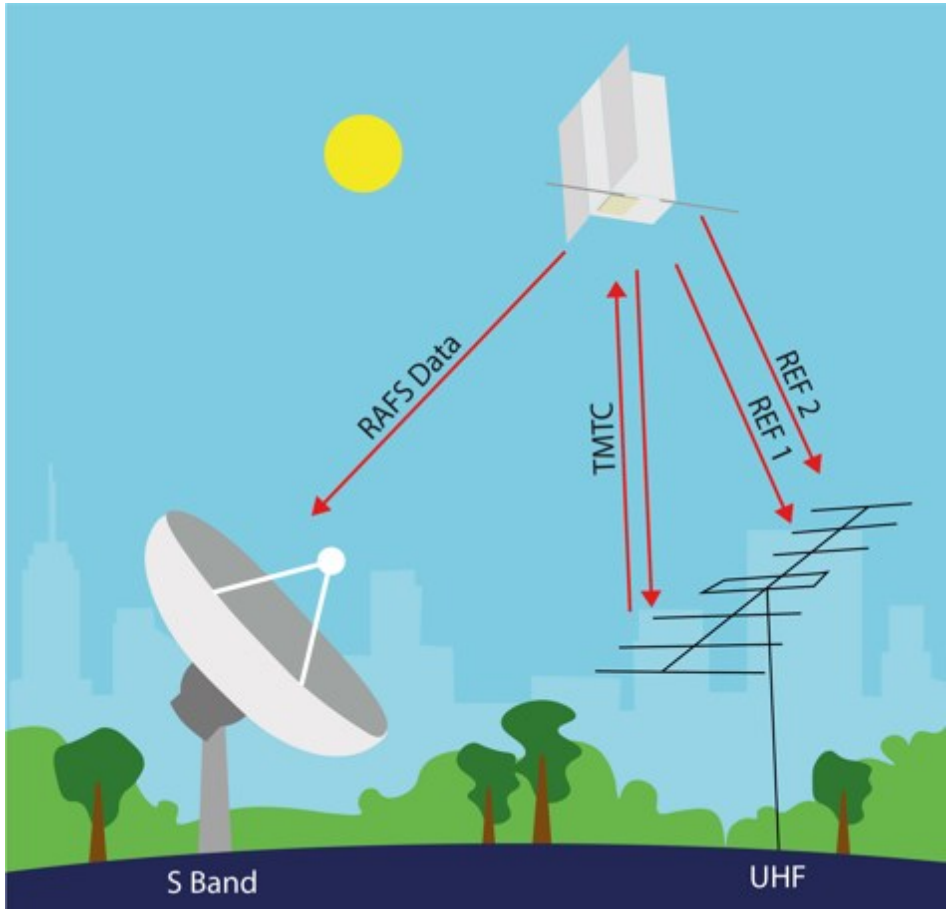
TÜBİTAK

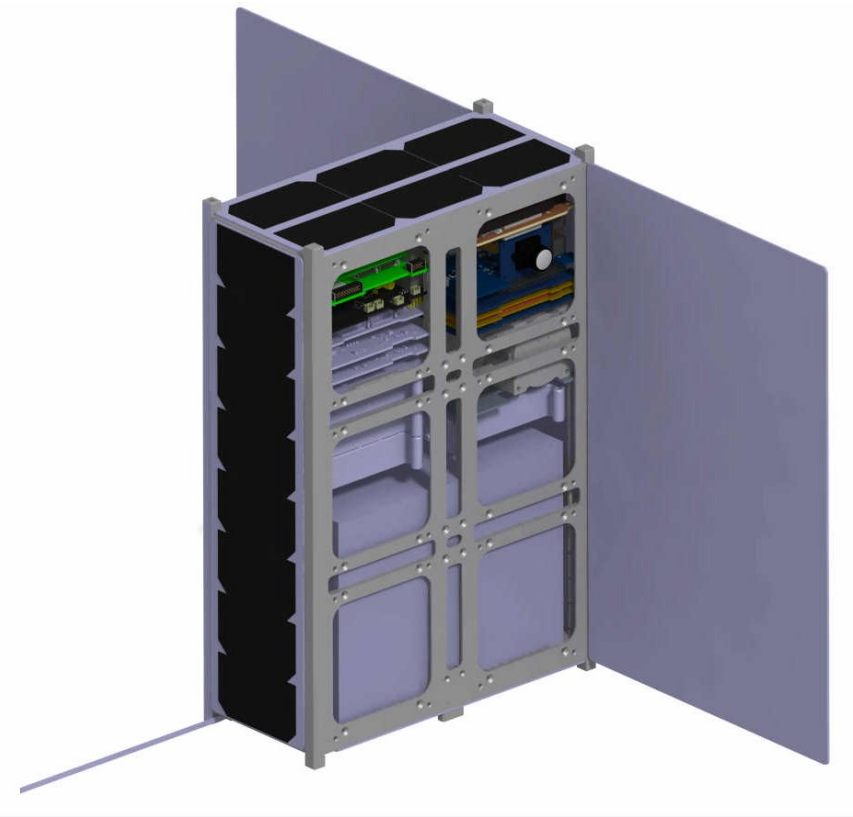
ITU/FAA
Faculty of Aeronautics and Astronautics
Space Systems Design and Test Laboratory
USTL

İTÜ RF ELEKTRONİK LABORATUVARI

TEKNOLOJİ

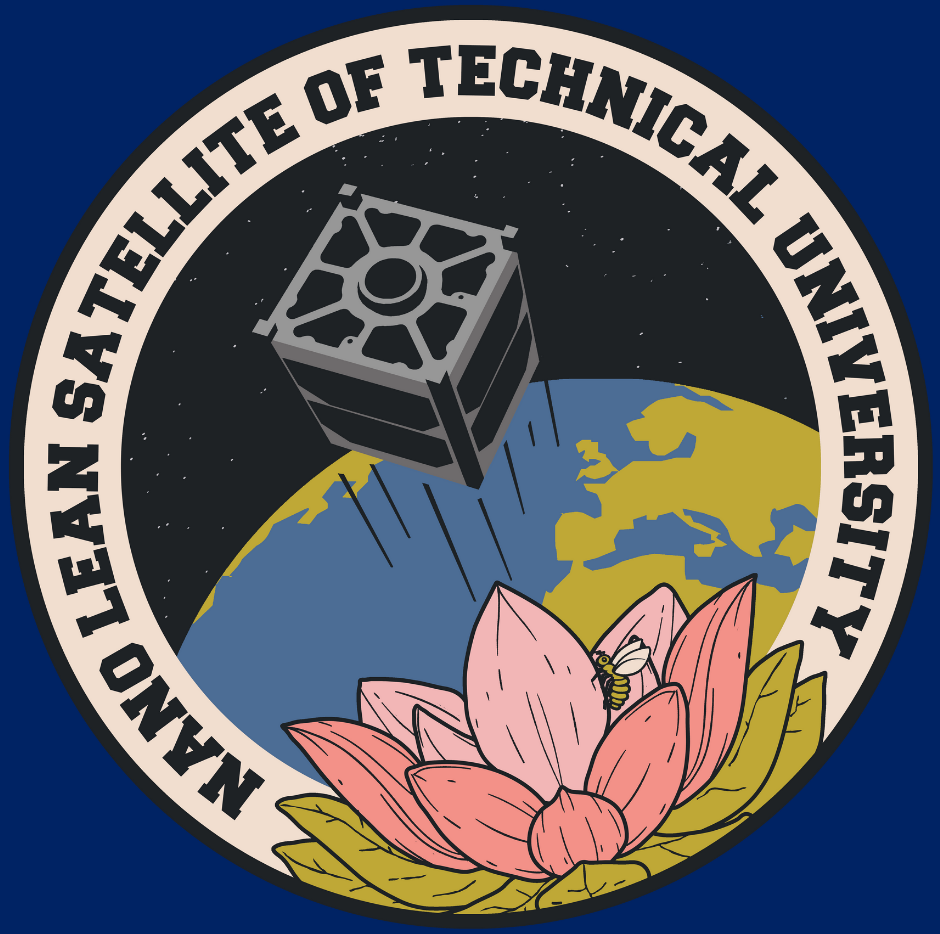
RAFS Concept of Operations





n-LOTUSat

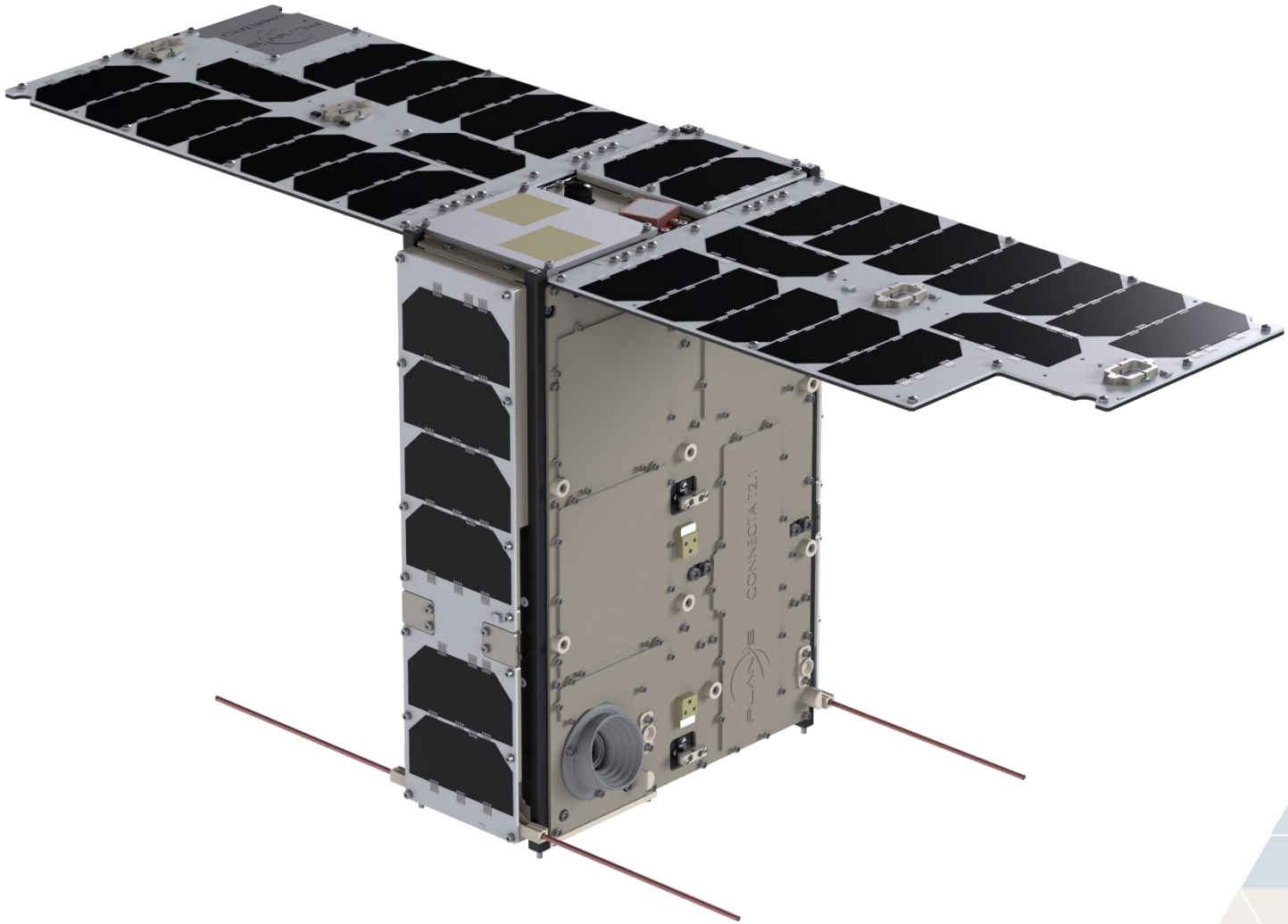
A 1U CUBESAT PROJECT



PLAN-S SATELLITE & SPACE TECHNOLOGIES

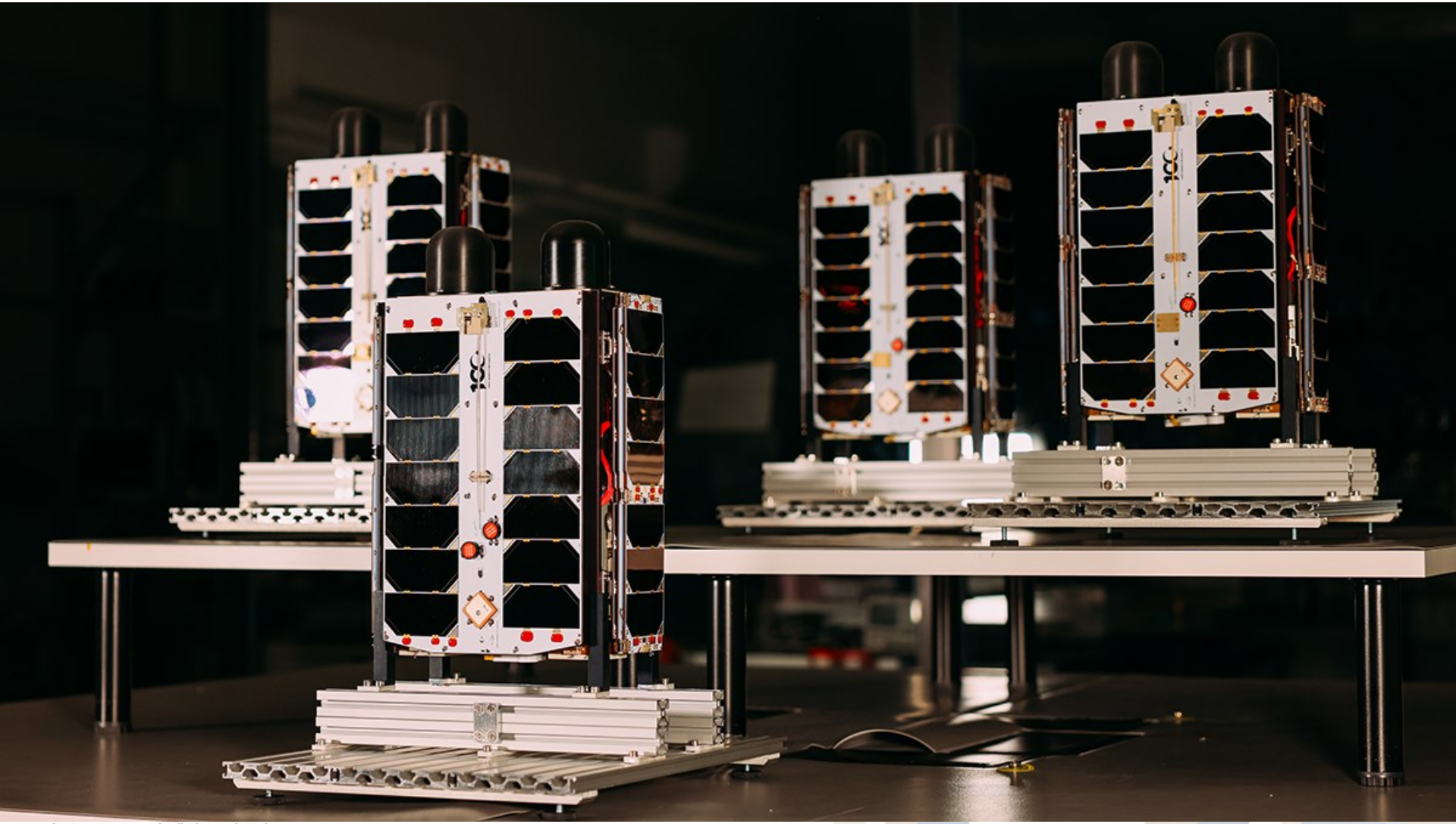
PLANS SATELLITE TECHNOLOGIES

- Establishment Summer 2021
- IoT and EO Constellations of 3U and 6U CubeSats
- Building tech demo missions
- 17 CubeSats in orbit,
- 12 IoT payload CubeSats in orbit being tested


CONNECTA T2.1

Jumeirah Palm Island/Dubai
2023-07-08 UTC: 06:33:58

Plan S 4 IoT CubeSats




The future is in the skies.
K. Atatürk
RAST'26
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ULUSLARARASI UZAY KONGRESİ (IAC) 2026 KAMPÜS BULUŞMALARI

ETKİNLİK PROGRAMI

Açılış Konuşmaları
IAC 2026 Tanıtımı
Astronotumuz ile Uzay Alanındaki Bilimsel Çalışmalar
IAC Bildiri Hazırlama Paneli

İTÜ

17 Ekim Cuma – 14.30

İTÜ Ayazağa Kampüsü, Süleyman Demirel Kültür Merkezi (SDKM)

Kayıt için okutunuz.


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5-9 OCTOBER 2026
MORE SPACE
ORTA DOĞU TEKNİK ÜNİVERSİTESİ
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İTÜ
Abdul Qayum Bin Alidin
Mohamad Kadmi Bin Suaidi
MELİKE NİKBAY
BARIŞ BEYOK

TARGETS

EDUCATE AND TRAIN ENGINEERS ON SPACE SYSTEMS, SATELLİTES AND ROCKETS
DEVELOP NANOSAT SYSTEMS TO ADVANCES KNOWLEDGE SCIENCE AND TECHNOLOGY

Increase capacity of subsystems

- To improve comm speed
- To improve data transfer rates
- To improve agility
- To improve power generation
- To improve lifetime in low orbits
- To improve space Env tolerances
- Fault tolerant Software architectures
- Ground station non amatuers

HELP NATIONAL and REAGIONAL SPACE TECHNOLOGY DEVELOPMENT

KEEP IT MULTIDISCIPLINARY, INTERNATIONAL AND MULTI INSTITUTIONAL

- Analyses of missions
- Earth orbiters
- Travels to moon and Mars
- Randevouz with space objects
- On board propulsion SYSTEMS, Water based SYSTEMS, Hybrid rocket development

We Look Forward To a Fruitful Cooperation

Towards being a civilization living in the Solar System

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