

Turkish UNISEC (UZTED) Activities



Prof.Dr. Alim Rustem Aslan, UZTED Coordinator, UNISEC Global PoC and StC
Manager, Space Systems Design and Test Laboratory

Istanbul Technical University, Faculty of Aeronautics and Astronautics,
Istanbul, Turkey

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Established as a legal society
23 Members from
13 Universities (7 Public + 6 Private)
G. Assembly 19.09.2021
18.01.2023

- UZTED Establishment and Meetings
- Model Satellite training for regional students
- Participation in international meetings (SAHA EXPO)
- Anatolian Rover Challenge, 22-25 July 2022
- Burkina Faso Model Satellite training, 26-30 December, 2022
- Egypt Hurghada Model Satellite WS, 10 December 2022
- Morocco Model Satellite training, 18-22 July
- NASA SPACE EXHIBITION Dec 2021-March 2022
- SHARJAH SAT1 Project and more CubeSat Projects
- Nlotusat Project
- PAUSAT1 Project
- 11th NSAT and 8th UNISEC GLOBAL MEETING 2022
 - UZTED papers



HYBRID EVENT
ICESCO'S FIRST INTERNATIONAL
MODEL SATELLITE (CANSAT)
TRAINING WORKSHOP &
AEROSPACE SYMPOSIUM
ICESCO HQ - RABAT - KINGDOM OF MOROCCO

REGISTRATION LINK



JULY 18-22 , 2022

10:00 AM GMT+1

WWW.ICESCO-ACCELERATOR.COM/CANSAT



المنظمة العالمية للتربية والعلم والثقافة
ISLAMIC WORLD EDUCATIONAL, SCIENTIFIC AND CULTURAL ORGANIZATION
ORGANISATION DU MONDE ISLAMIQUE POUR L'ÉDUCATION, LES SCIENCES ET LA CULTURE

FIRST INTERNATIONAL

ICESCO MODEL SATELLITE (CANSAT). WORKSHOP & AEROSPACE SYMPOSIUM

” BUILDING TOMORROW'S
GLOBAL WORKFORCE ”

July 18-22, 2022

10:00am to 5:00pm GMT



Website



Registration



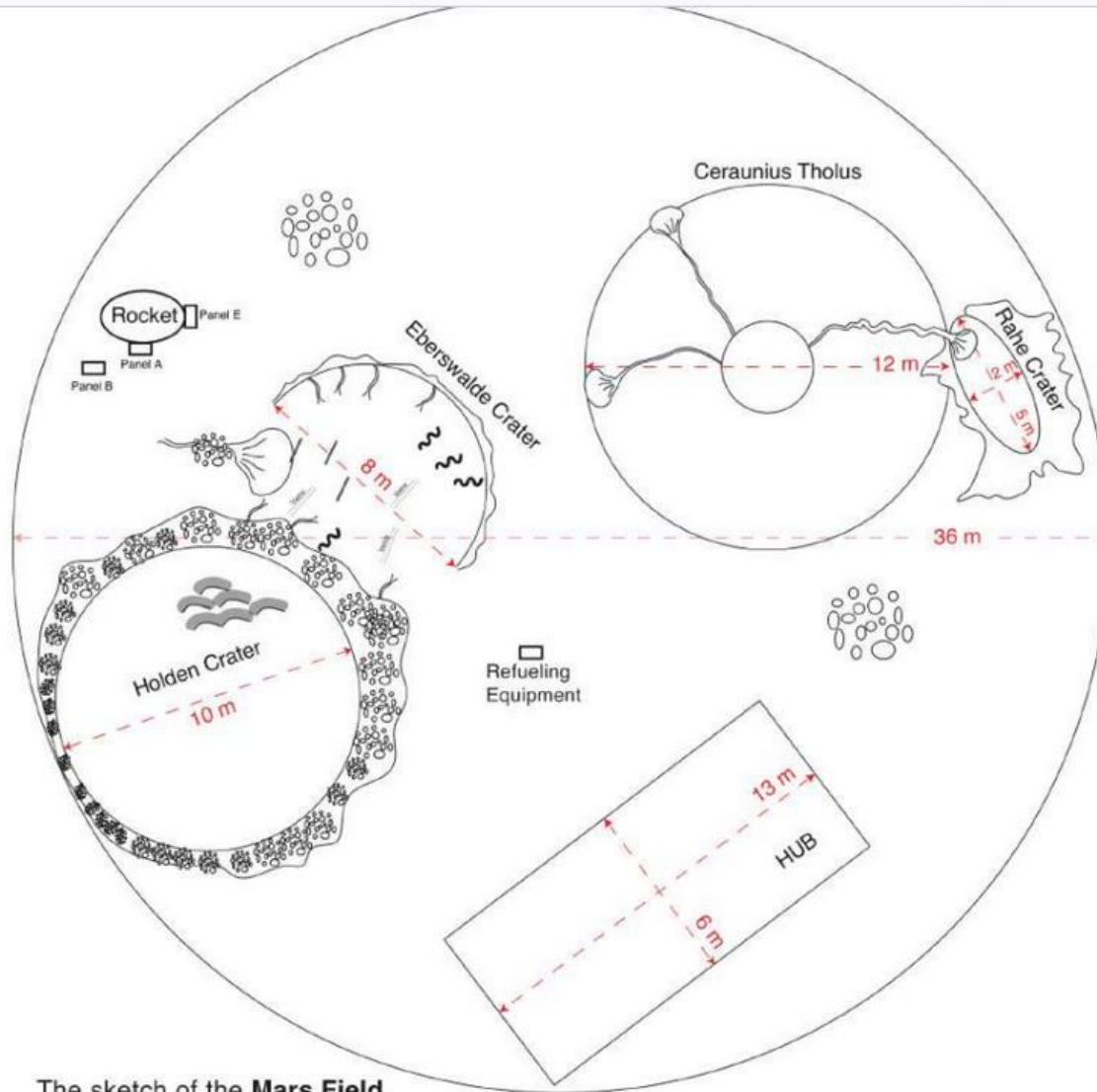






Anatolian Rover Challenge










- **Anatolian Rover Challenge** is an annual international “**rover**” challenge. In the scope of the challenge, the teams of students that are affiliated by academic institutions try to achieve the determined missions by their own designed "planetary exploration robots" called **rovers**.
- The student teams to apply for the challenge go through a design report process.
- After the evaluation of all reports, teams that qualify for the finals are determined, and announced to participate in the finals.
- The finals are held in the carefully designed challenge area. The challenge area consists of an open field with a diameter of approximately 40 meters.
- The area is designed to resemble the surface of a planet or a celestial body to be explored.



The sketch of the **Mars Field**

The Mars field in ARC'22 is filled with features that requires scientific exploration by your rover. Find a solid hypothesis and form your experiments around. We kindly remind you that

Results Of The Competition

Team	Mission 1 Score	Mission 2 Score	Mission 3 Score	Mission 4 Score	Total Score
 Project Scorpio	70	33	49	83	235
 Project Kratos	66	0	69	98	233
 MIST Mongol Barota	84	4	62	67	217
 RoverOva	50	33	35	77	195
 Yıldiz Rover	13	7	39	48	107
 Team Anveshak	0	6	13	43	62
 GTU Rover	3	0	26	30	59
 Ska Robotics	10	0	5	40	55
 Kapsul Rover	3	0	0	39	42



THE WORLD'S BIGGEST TOURING SPACE EXHIBITION

Nasa Space Adventure Exhibition is in Metropol Istanbul with its interactive experience zones, until end of February!

İTÜ-SSDTL Space Systems Design and Test Lab

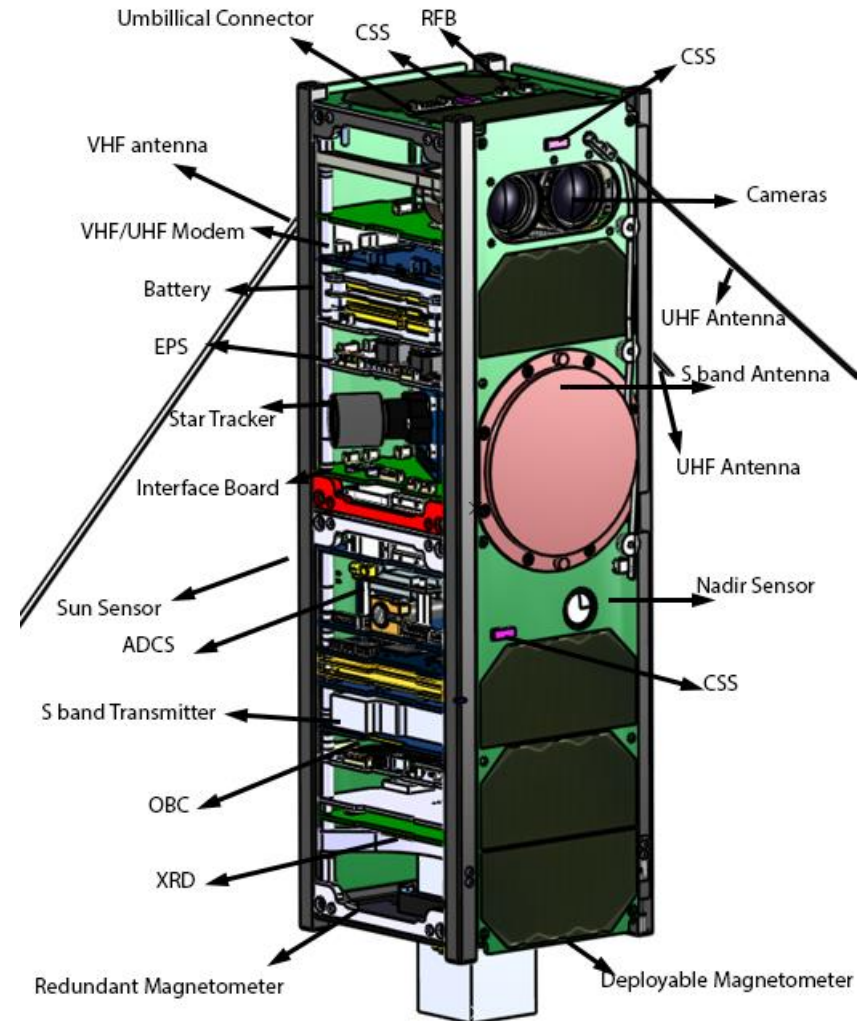
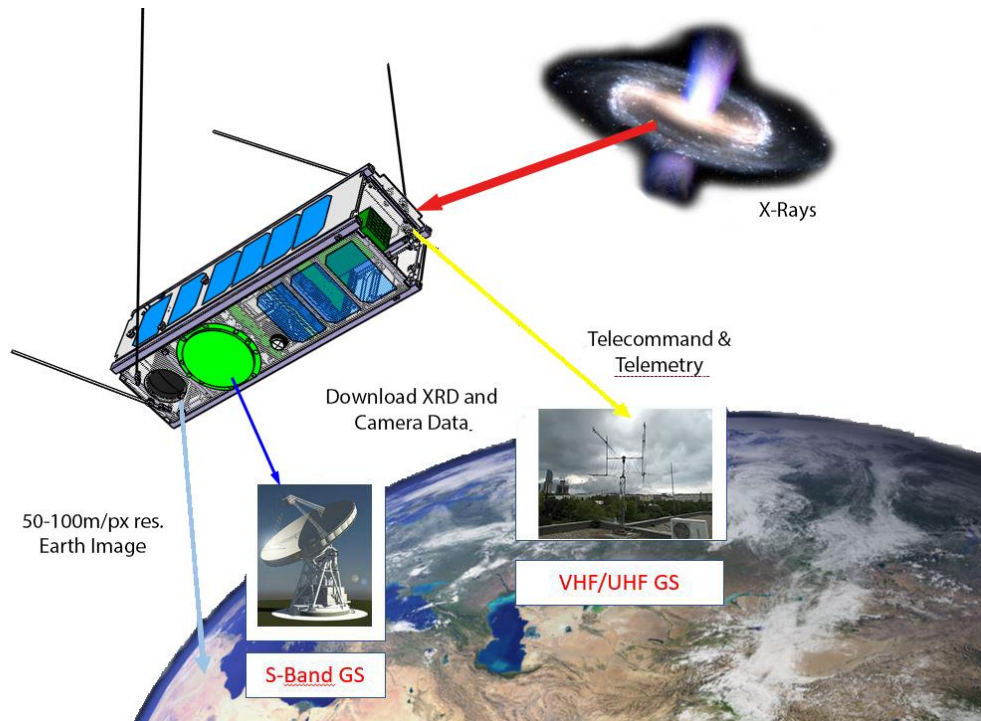


İTÜ-SSDTL CUBESAT PROJECTS

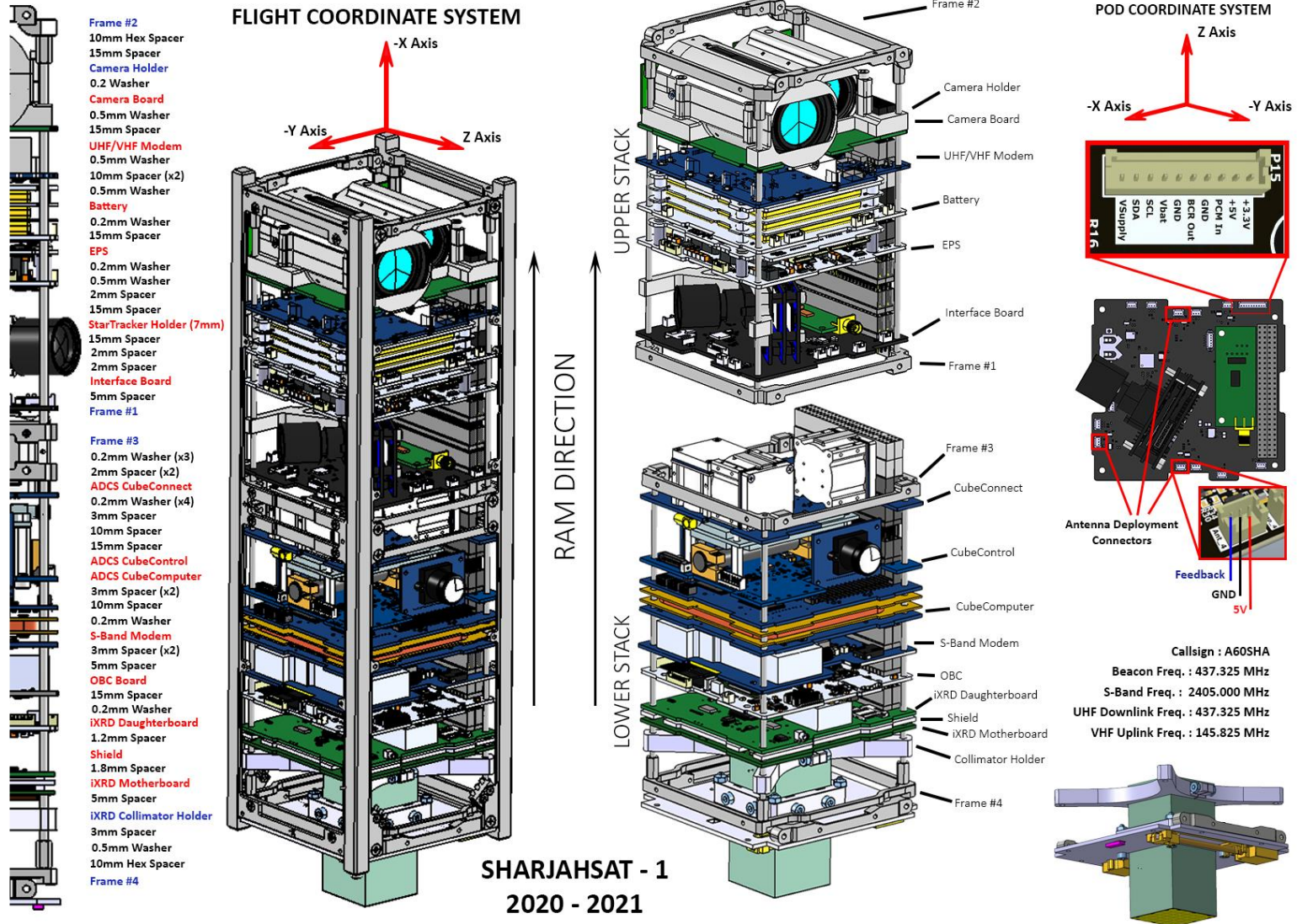


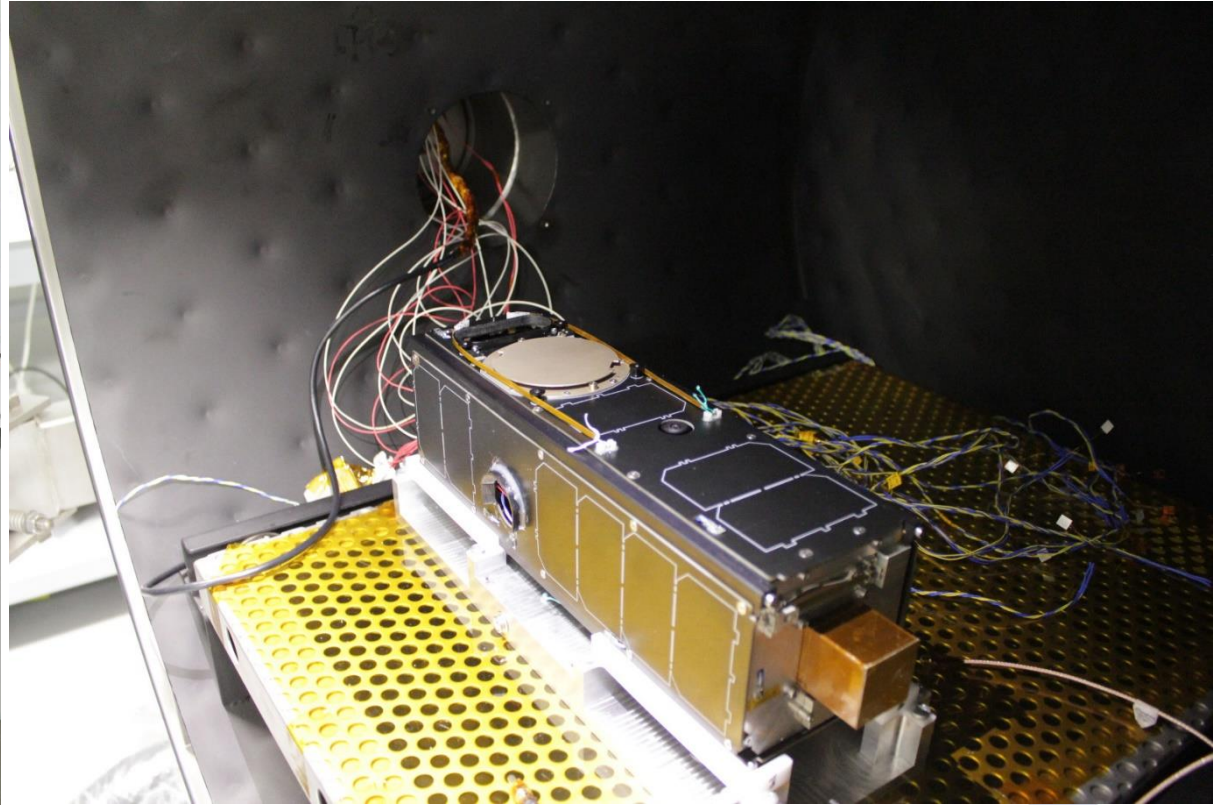
- UNIVERSITY of SHARJAH, UAE
- Istanbul Technical University
- Sabancı University
- Capacity development through
 - Science mission: star detection and sun observation
 - Imaging mission: earth and space
- Payload
 - X Ray detector
 - Optical camera
- Launched 3 January 2023

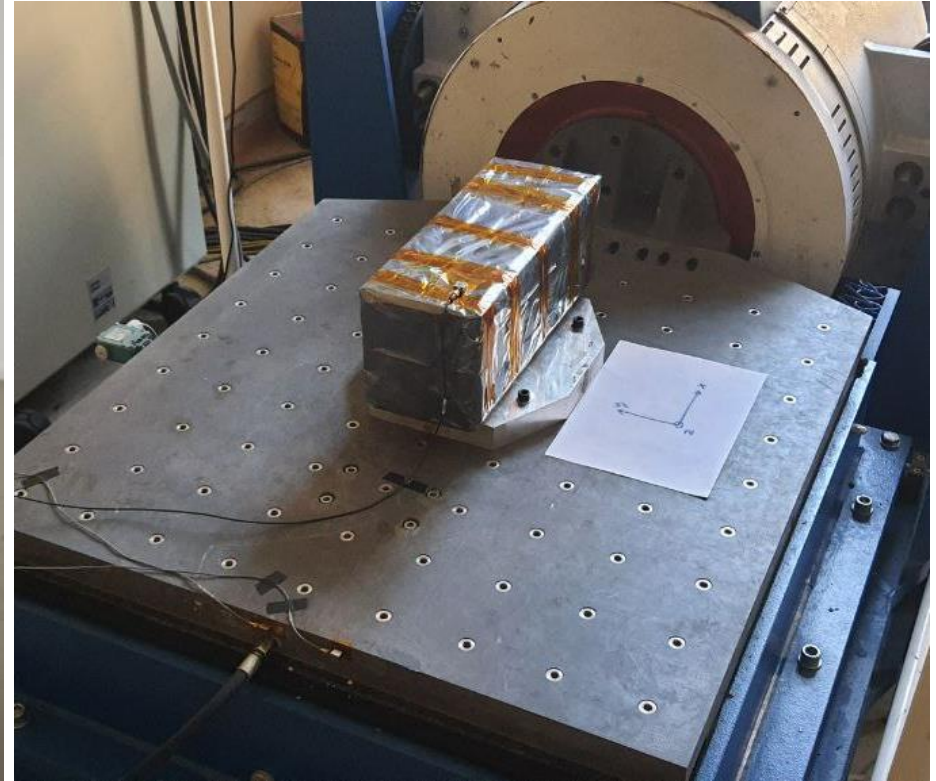
SHARJAH SAT -1





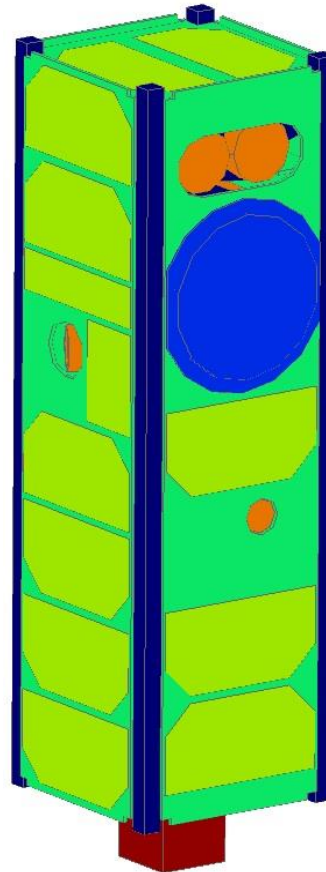




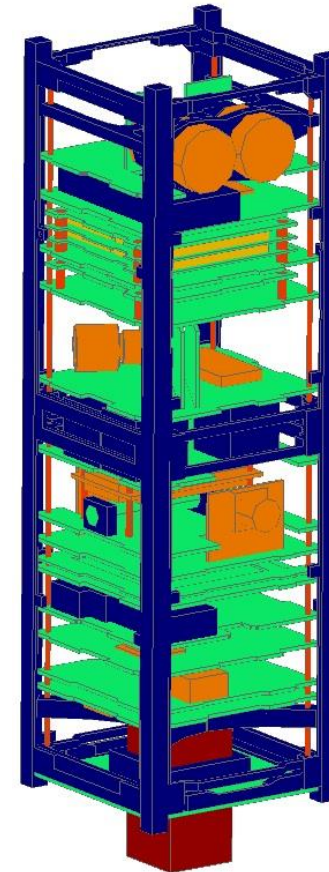




CAD model



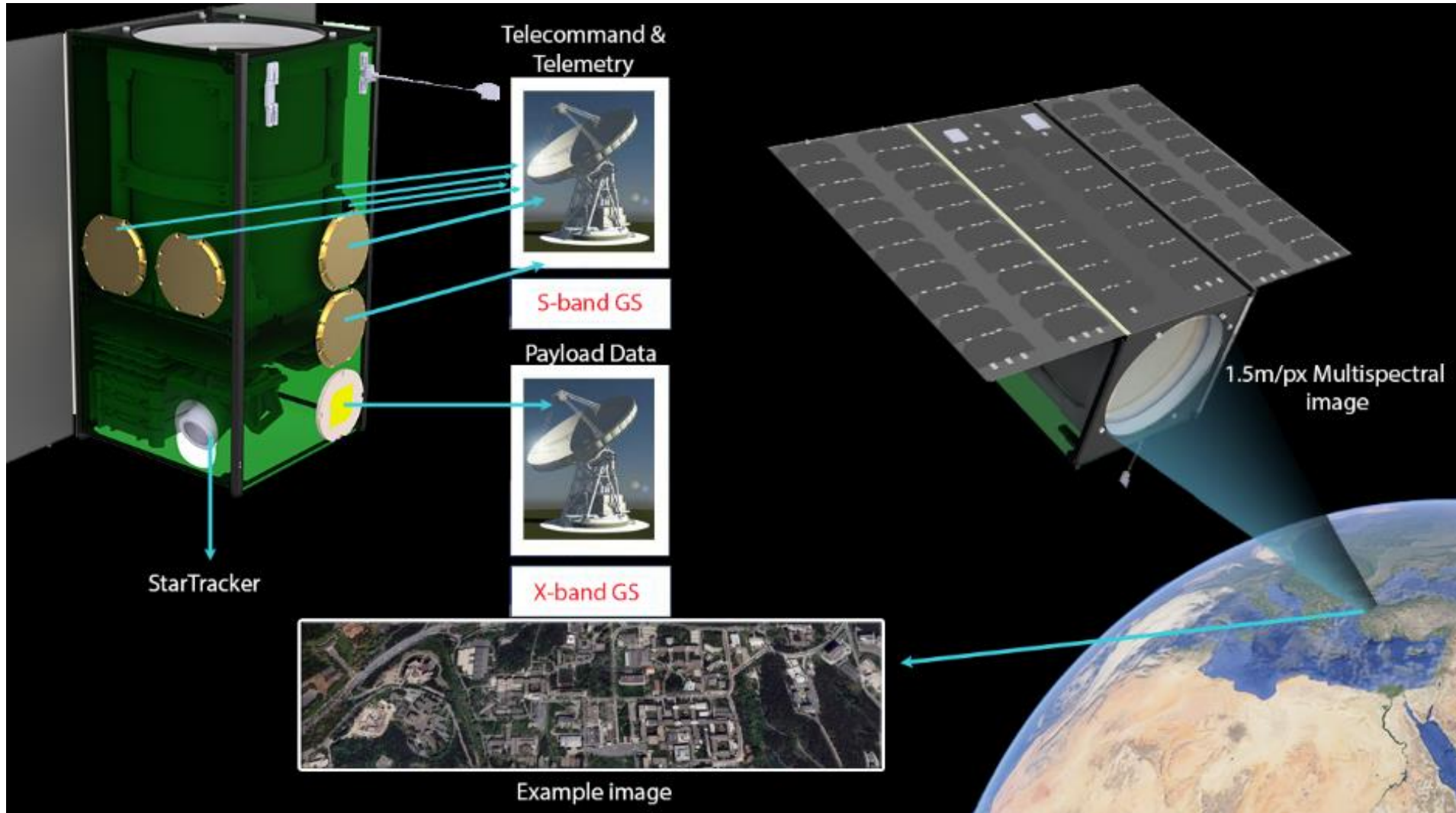
Thermal model



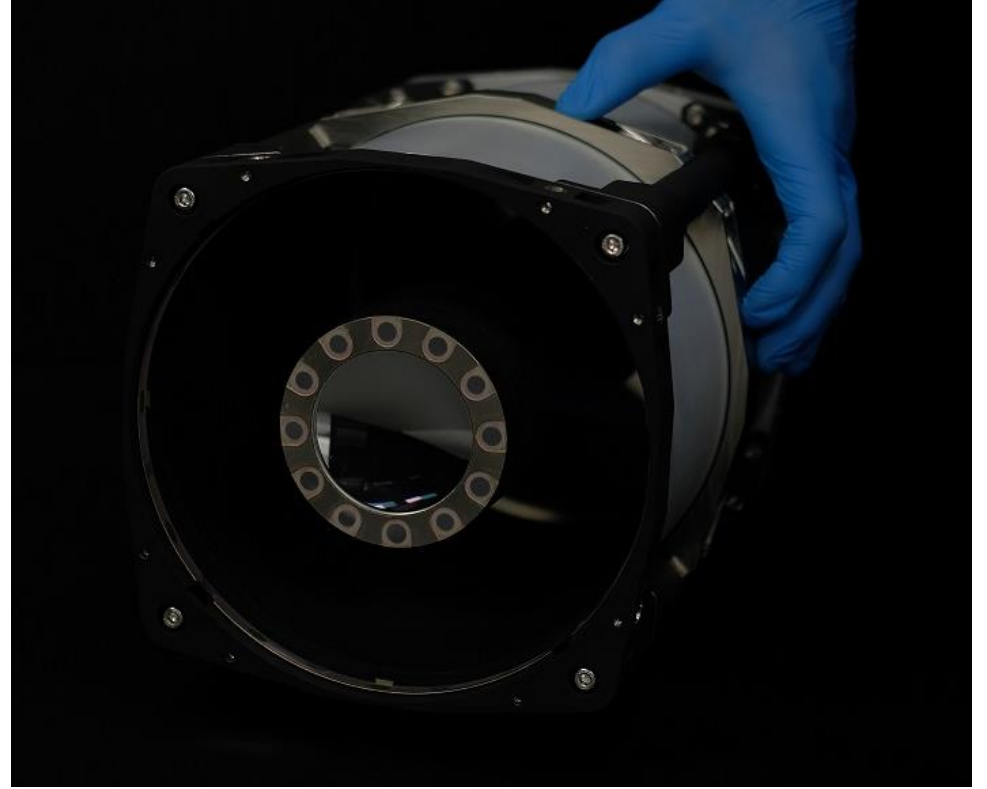
Thermal model interior

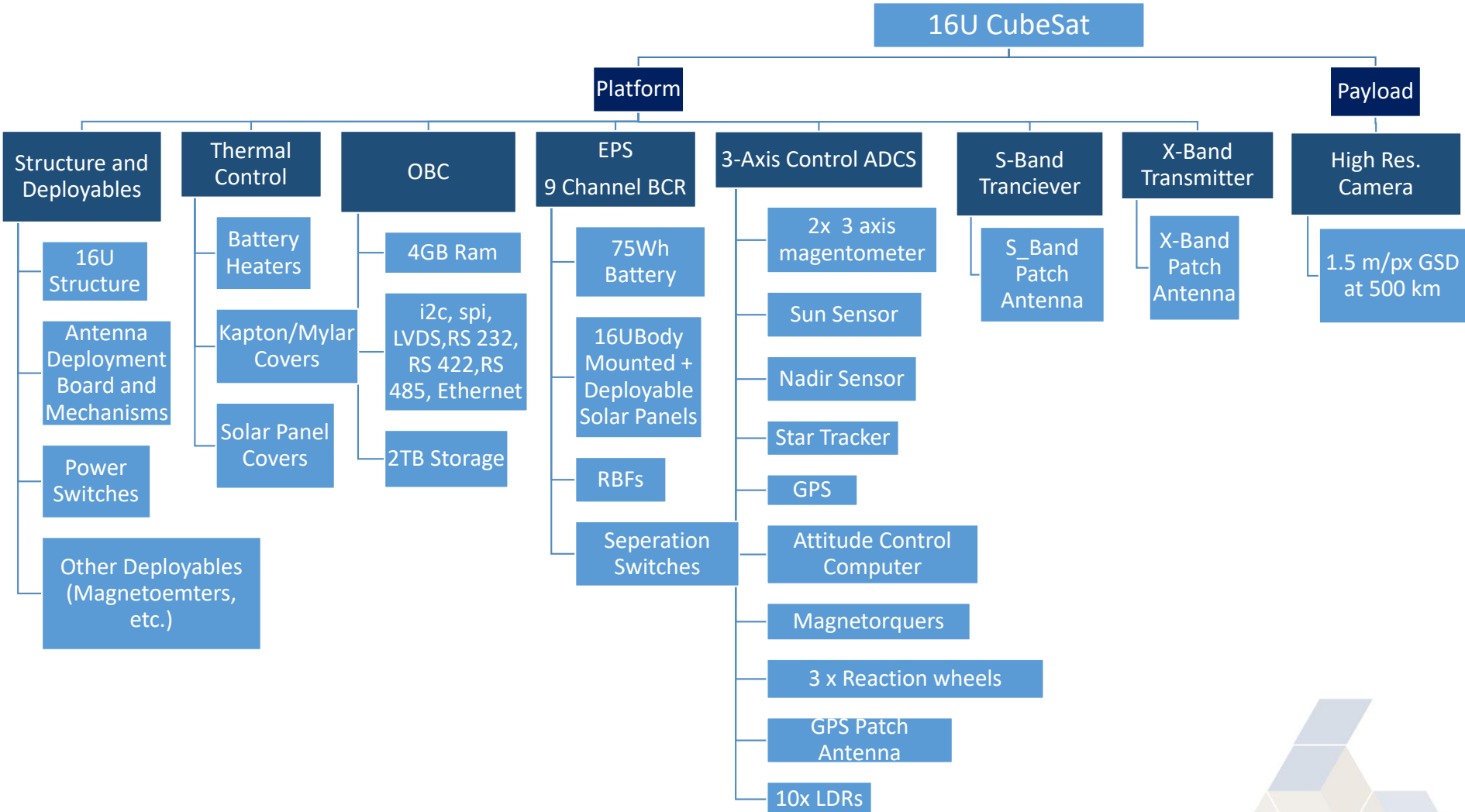
Physical properties material	
AL 7075	
Berillium	
CdZnTe	
Ceramic	
Copper	
Gallium Arsenide	
NiMh	
Silica	
Steel A4	
Tungsten	

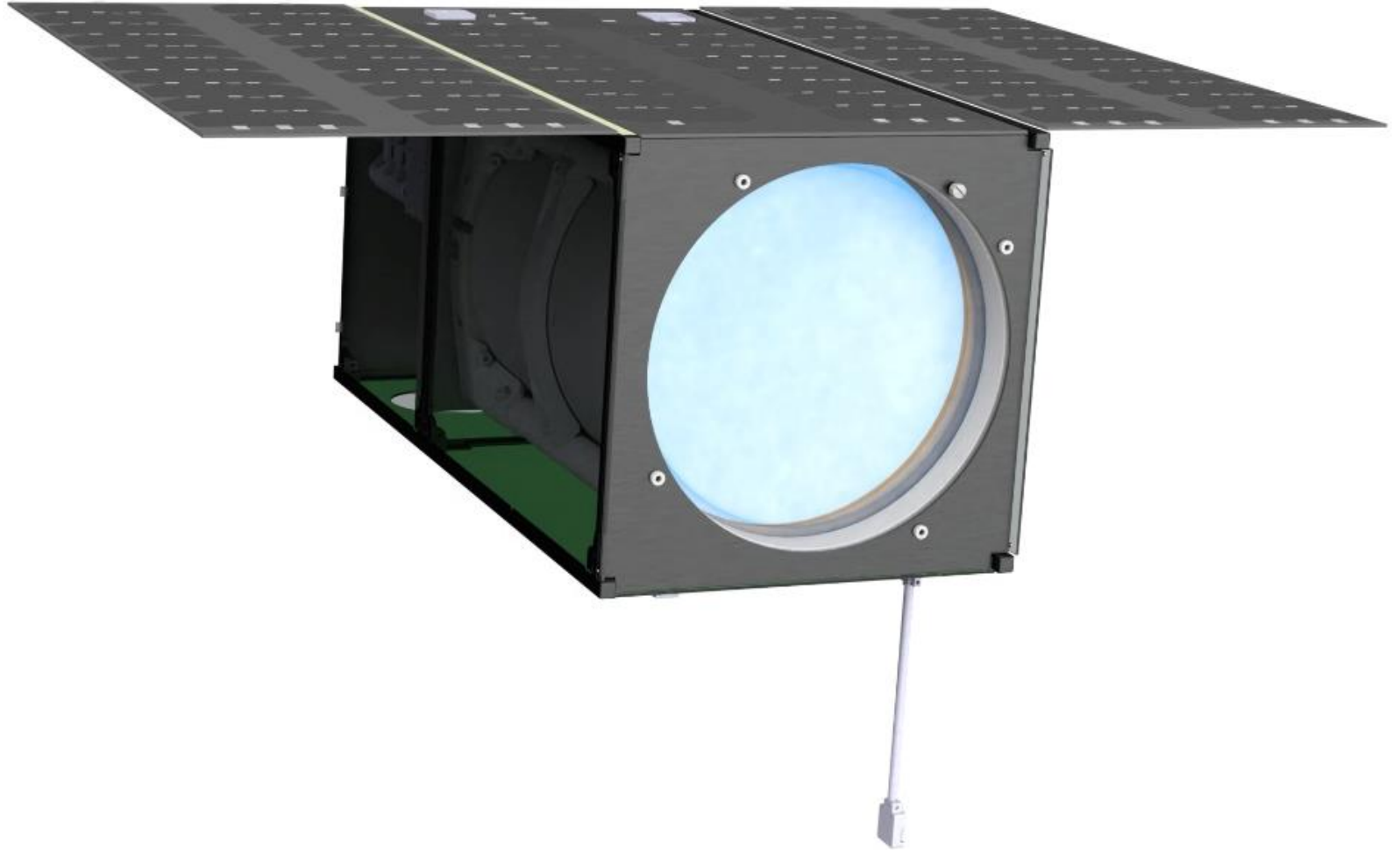
1.5M GSD at 500 km Earth Observation Mission





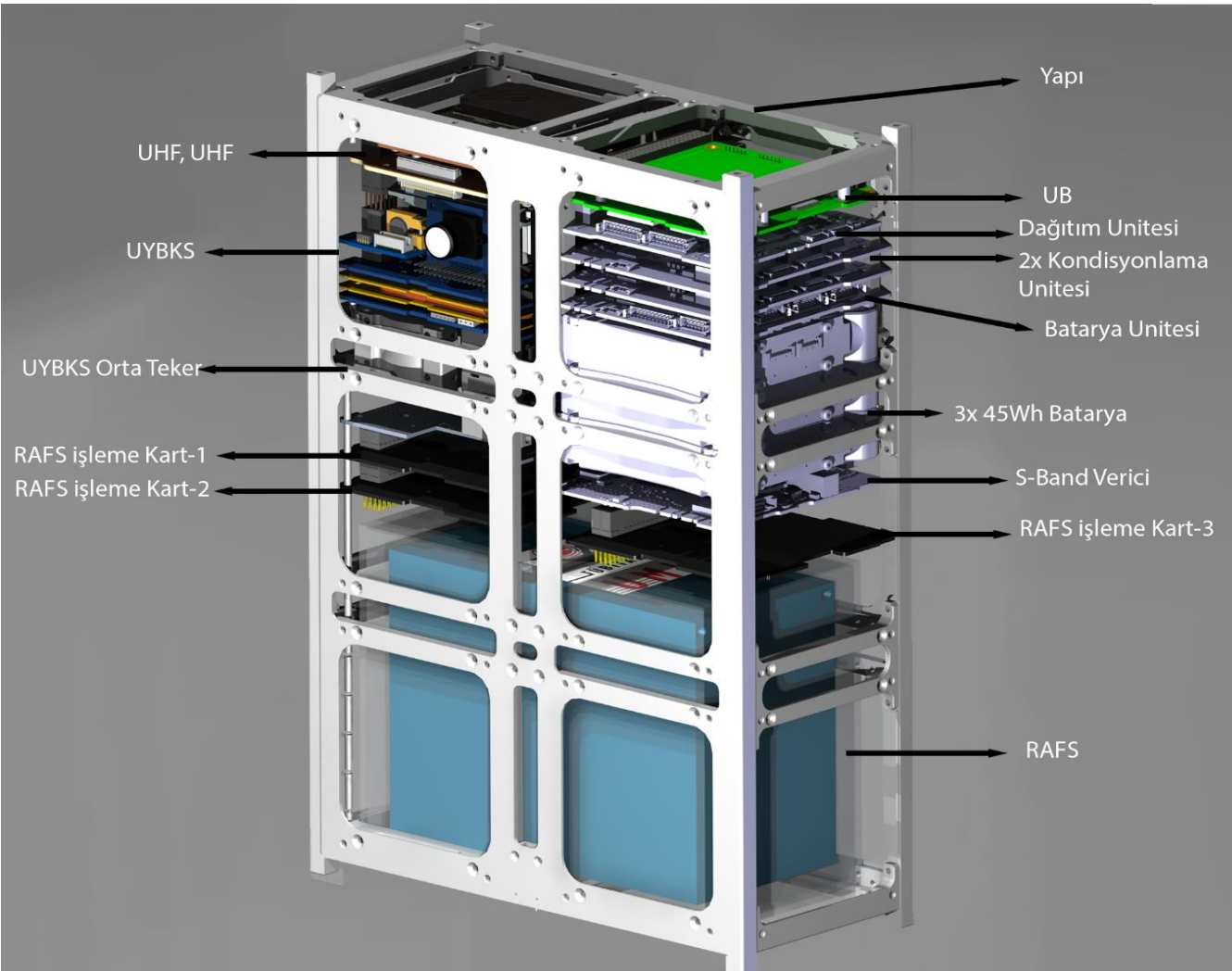






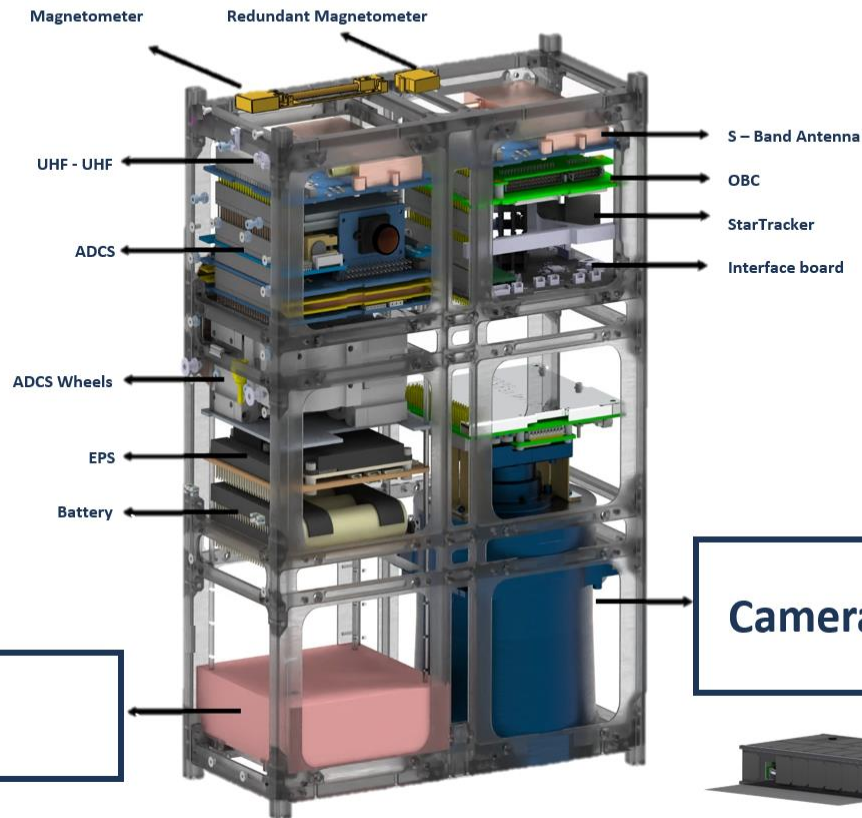


Rubidium Atomic Frequency Standard (RAFS) CubeSat



- RAFS Payload
- RAFS
 - RAFS **signal transfer**
- RAFS ve Sat **thermal management**
- 6U Structure
- OBC and interfaces
- EPS
 - Battery (135Whr)
 - Panels 75W
 - PDCU
- Comm
 - UHF-UHF trcv, antenna
- ADCS, wheels
- **Imaging**

The CUBESAT



Camera



Technical Specs

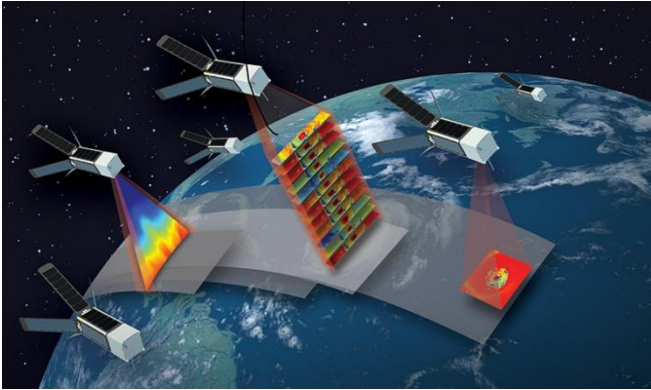
Altitude / Orbit	500-600 Km
Mass	Max 12 kg
Dimension	10*22*34cm
Resolution	5m GSD /500 km
Mission Duration	3 years min
Orbital Period	98 min
Revisit Time	1-4 days
Budget	~3M USD

1x GPGPU board
1x Interface Board

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



AVT-336 (RSM) Enabling Platform Technologies for Resilient Small Satellite Constellations for NATO Missions



Team leader(s): A.R. Aslan (TUR)
V. Wickramasinghe (CAN)

Panel Mentor: M. Huggins (USA)
Members: AUS, CAN, DEU, DEN, ITA, NLD, NZL, PRT, SWE, TUR, USA

Duration: Jan 2019 - Dec 2021

Coordination: SCI Panel, NATO Organizations

Related activity SCI 318, AVT-ET-181, AVT 257

Objectives:

A Technical Team is proposed to further communicate and advance enabling platform technologies for resilient small satellite constellations for NATO missions by organizing a Specialized Meeting in 2021.

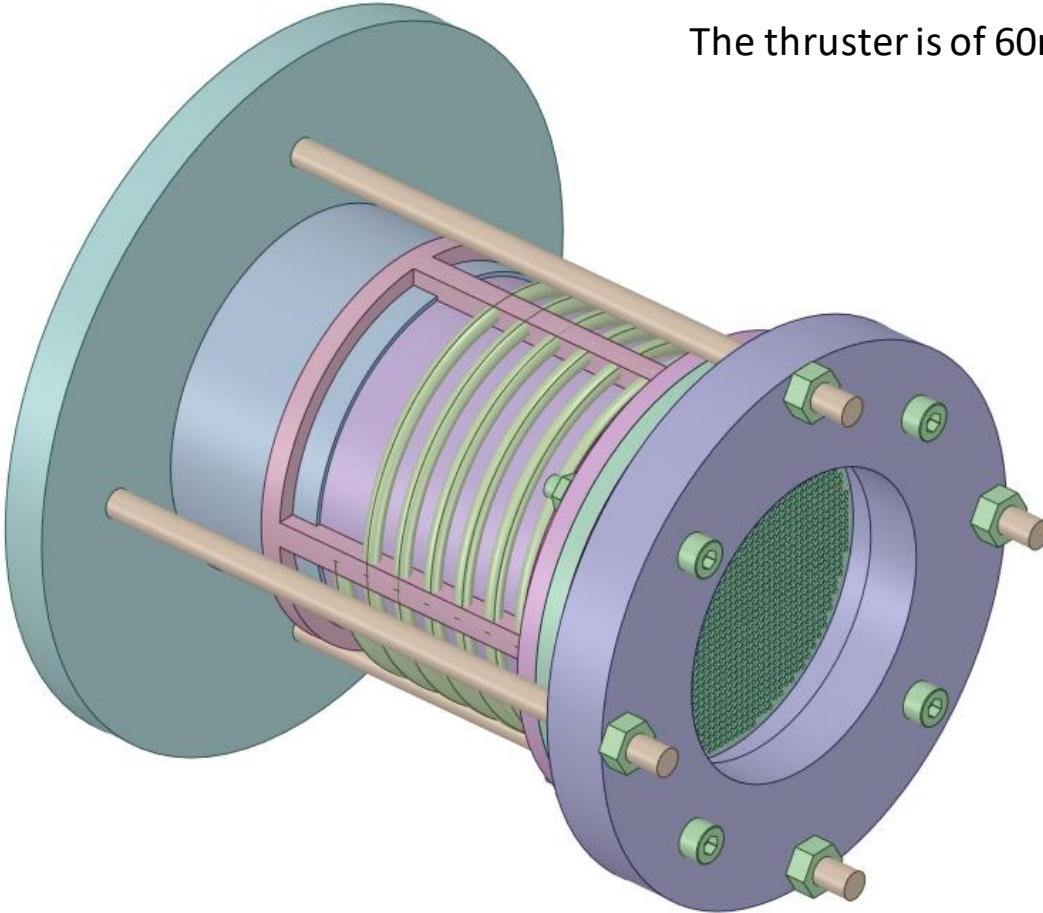
Deliverable:

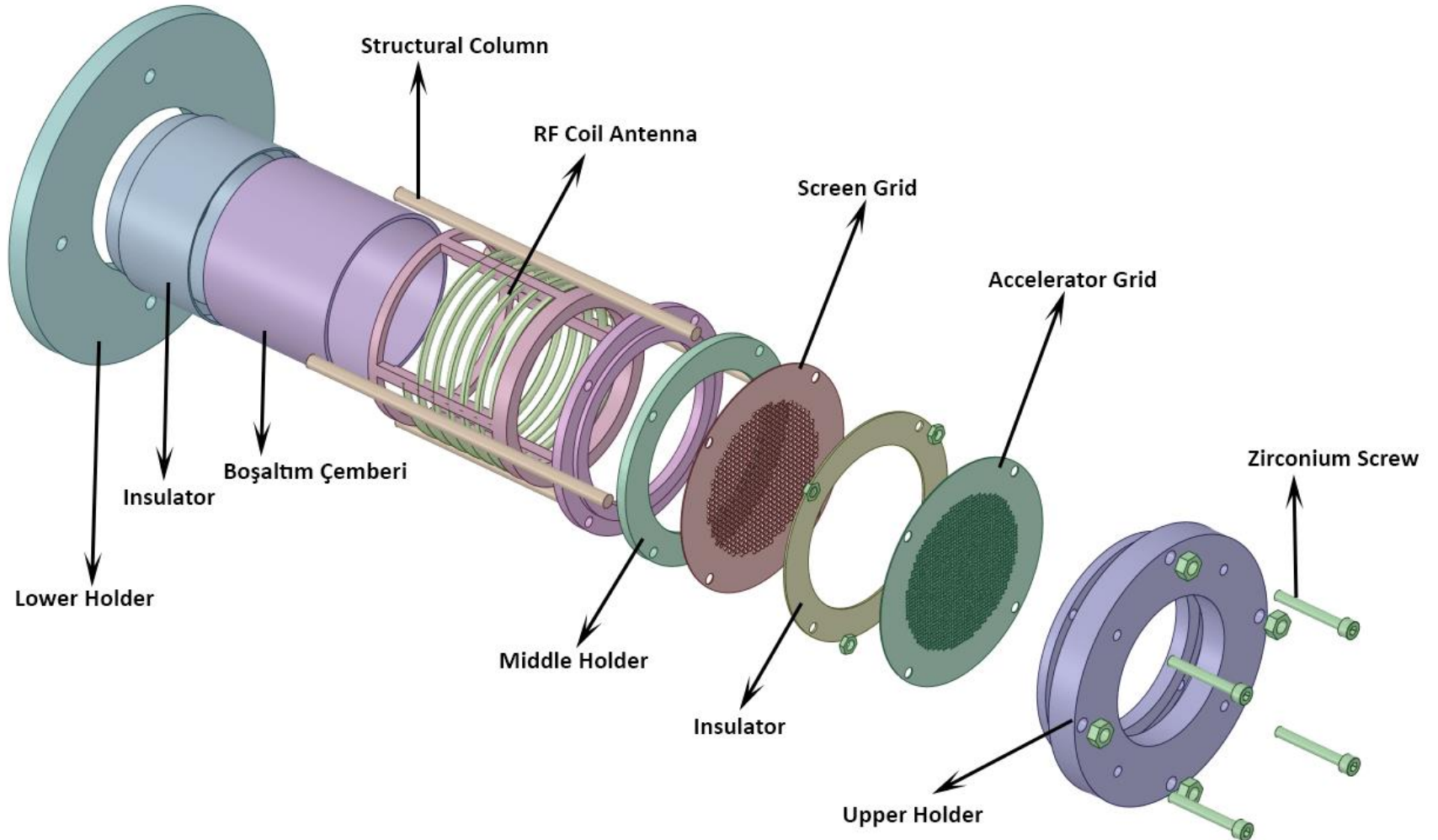
Report on exploiting enabling platform technologies for resilient small satellite constellations in order to enhance the quality and timeliness of information provided to NATO warfighters

Impact and Exploitation DOTMLPFI

- Directly advances technology for two Long Term Aspects defined in the 2015 STB Science & Technology Priorities, i.e. “Intelligence Surveillance and Reconnaissance (ISR) Collection Capability” and “Space Capability Preservation.”
- Enhances space capability and availability of Smallsats, for various NATO missions including communications, geo-positioning and ISR
- Identifies viable new approaches and techniques consistent with SmallSat Constellation Platform Technologies to more completely access the benefits of Smallsats to support the warfighter

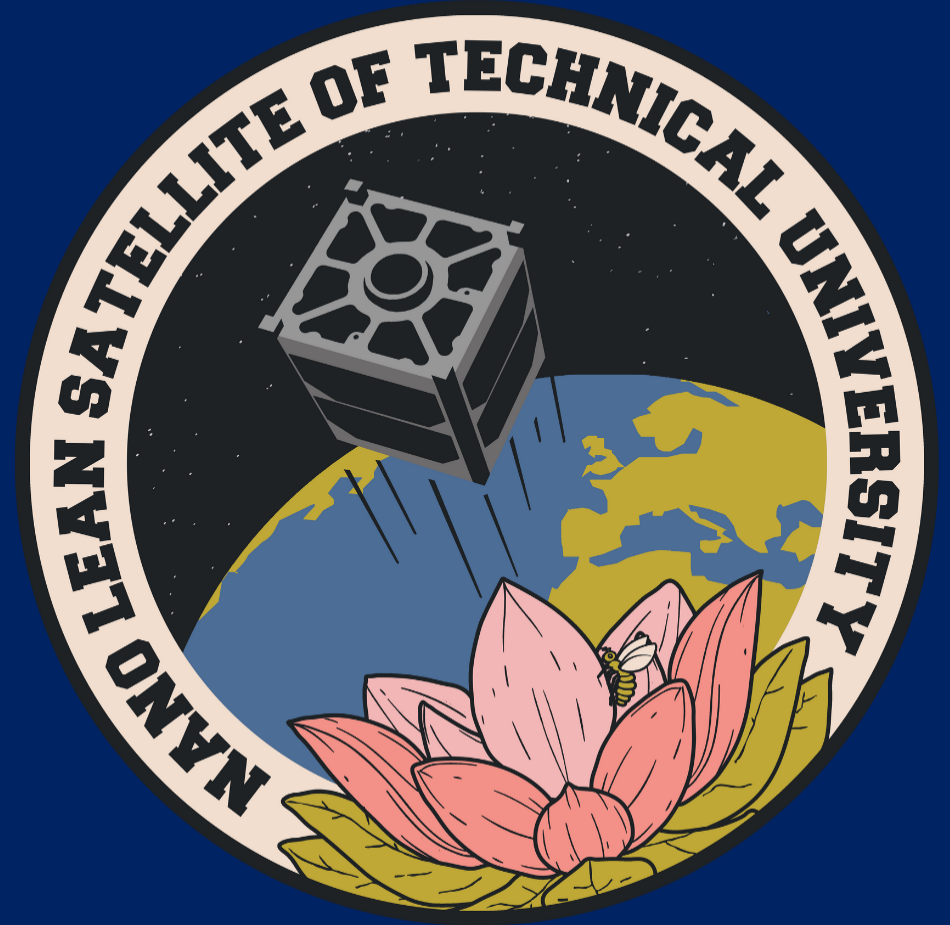
The thruster is of 60mm diameter and 109 mm height





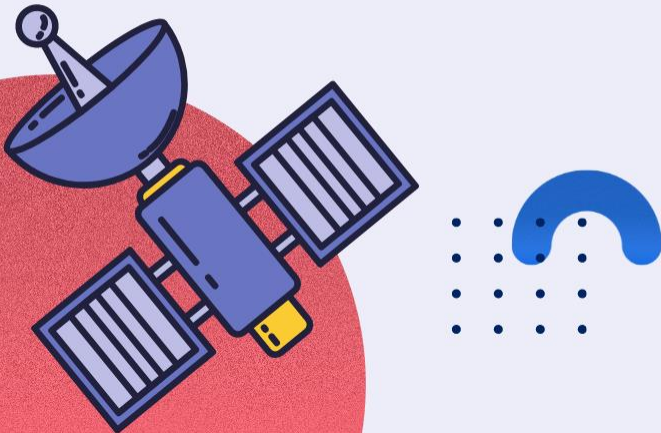
n-LOTUSat

A 1U CUBESAT PROJECT



WHO ARE WE?

- "Nano Lean Satellite of Technical University"
- 1U cubesat project
- Developed by undergraduate students from with CanSat experience





OUR GOALS

- To gain interdisciplinary experience in the development stages of a cubesat
- To practise aerospace engineering in undergraduate level
- To develop our own electronic systems & designs, and gain flight heritage to them



MISSION

MAGNETOMETER PRODUCTION

- designing and manufacturing our own sensor

DOSIMETER

- COTS
- data analysis after launch

MAGNETOMETER PRODUCTION

- COTS
- software & algorithm development



PLAN-S SATELLITE & SPACE TECHNOLOGIES



- Establishment Summer 2021
- IoT and EO Constellations
- Building tech demo missions
- 3U and 6U CubeSat



ABOUT US

Kontrolmatik
Technologies

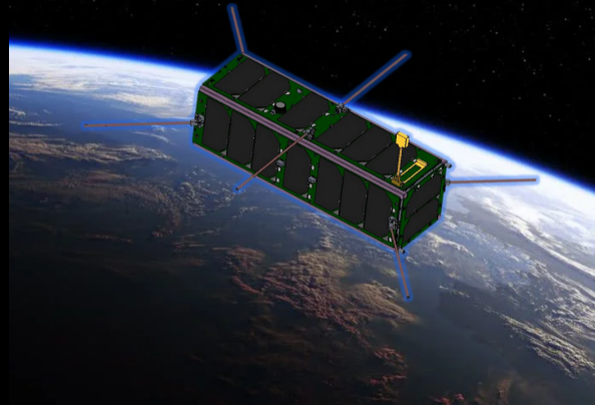


INFINIA

Plan-S Satellite and Space Technologies, established in 2021 with the partnership of Kontrolmatik and INFINIA and started its operations in New Space applications.

Plan-S designs and builds nano-satellites for low-earth orbit, small satellites for its customers and aims to offer end-to-end Satellite as a Service solutions.

Plan-S has already signed the launch agreements to send three test satellites into orbit in the 2022.



As Turkey's largest private initiative in the field of satellite and space technologies, Plan-S aims to

- develop satellite technologies and satellite subsystems,
- provide satellite based IoT services as one of its primary business lines
- offer innovative solutions in areas where conventional communication is insufficient
- become leader in satellite service technologies



INVESTMENTS



We started building our R&D facility and it will be ready by the Q4 of 2022;

- 9000 m2 in total
- 10.000 class clean room
- 100.000 class clean room
- TVC, Vibration and Climatic Test Chambers/Equipments
- EMI/EMC & Antenna Measurement Laboratories
- Electronic and Mechanical Laboratories



ROADMAP

June, 2022

Connecta Test Satellite #1.1



Test satellite for low power
communication trials with IoT devices

Size: 3U

December, 2022

Connecta Test Satellite #2.1 & #2.2



2 test satellites for earth observation
with high resolution cameras & narrow
band comm. trials with IoT devices

Size: 6U & 6U

Q4, 2023 and Beyond

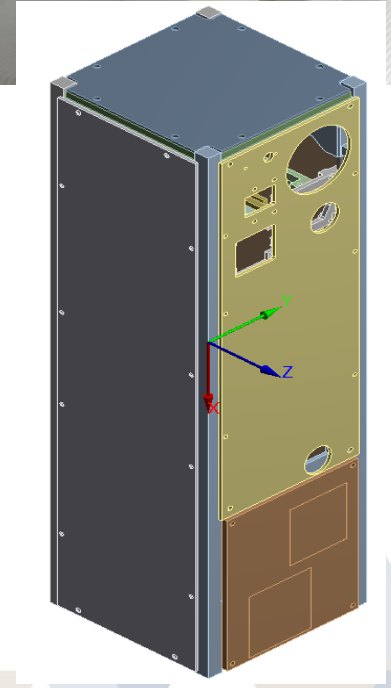
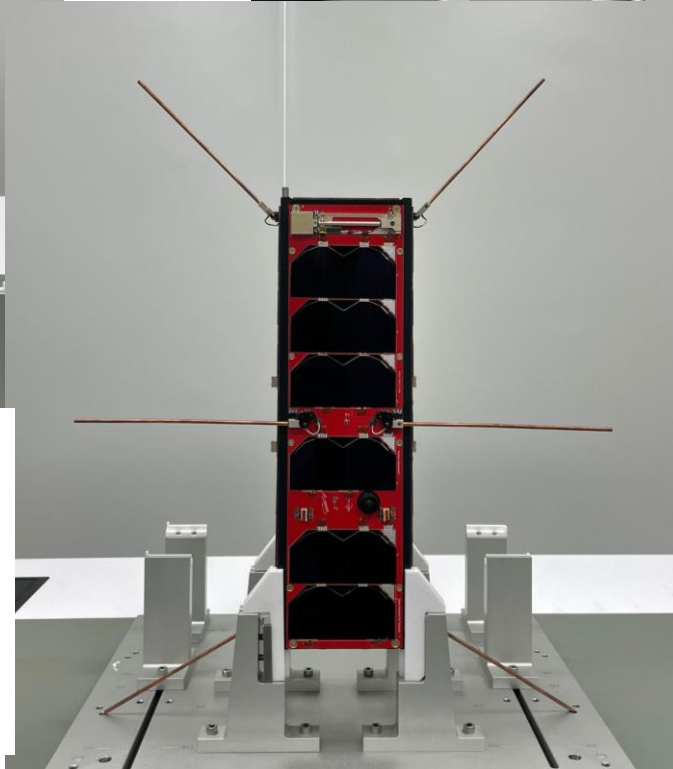
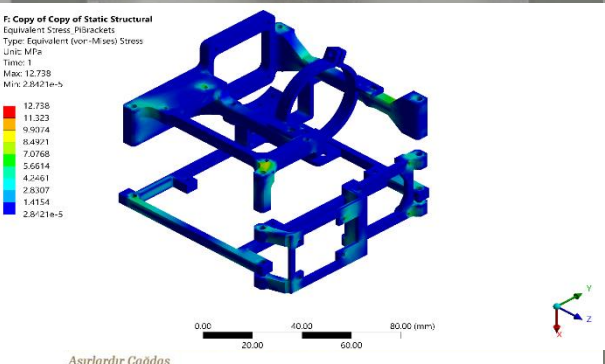
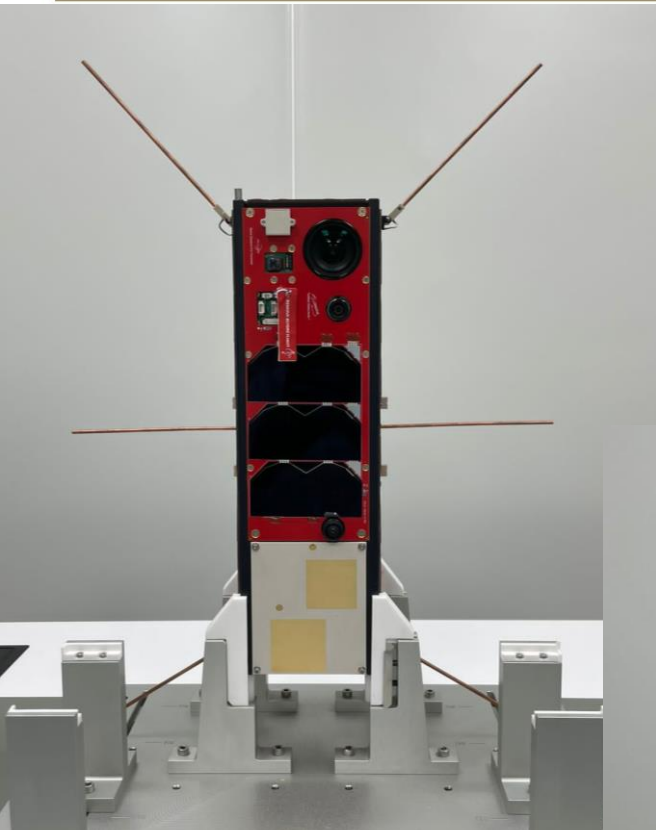
Connecta IoT Satellite Constellation



Narrow band IoT connectivity
Global coverage

Size: TBD

of Sat: >100



ROADMAP

June, 2022

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Q4, 2023 and Beyond

Connecta IoT Satellite Constellation



Narrow band IoT connectivity
Global coverage

Size: TBD

of Sat: >100

MISSION DEFINITION OF CONNECTA T2.1

Connecta T2.1 is a technology demonstrator for detection, early warning and management of forest fires and natural disasters like floods and landslides.



ROADMAP OF THE PROJECT

PHASE-A

Connecta T2.1 Mission

Tech. Demonstrator & Development Platform

PHASE-B

Design and Development of the System
(Satellites & Ground Equipments)

PHASE-C

Deployment of the Constellation, Installation
of the Complete System & Operation



Forest Fire - South Coast of Turkey

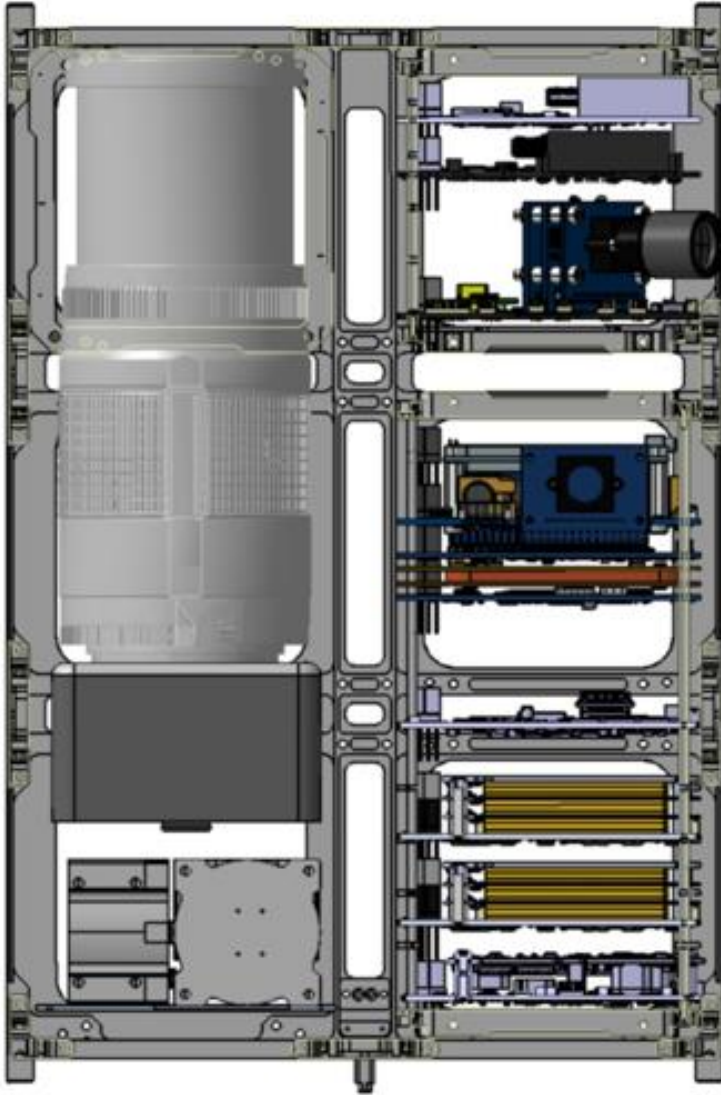


Flood- North of Turkey

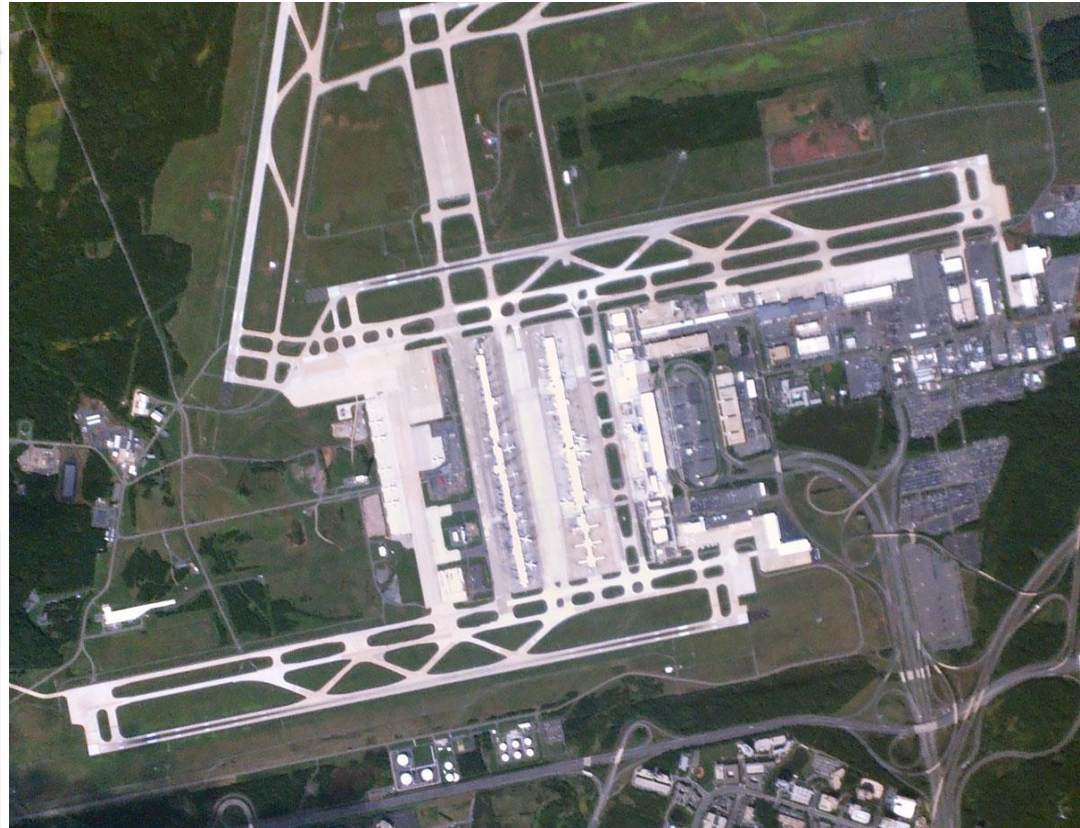


Landslide- North of Turkey

6U CubeSat for EO, <5m

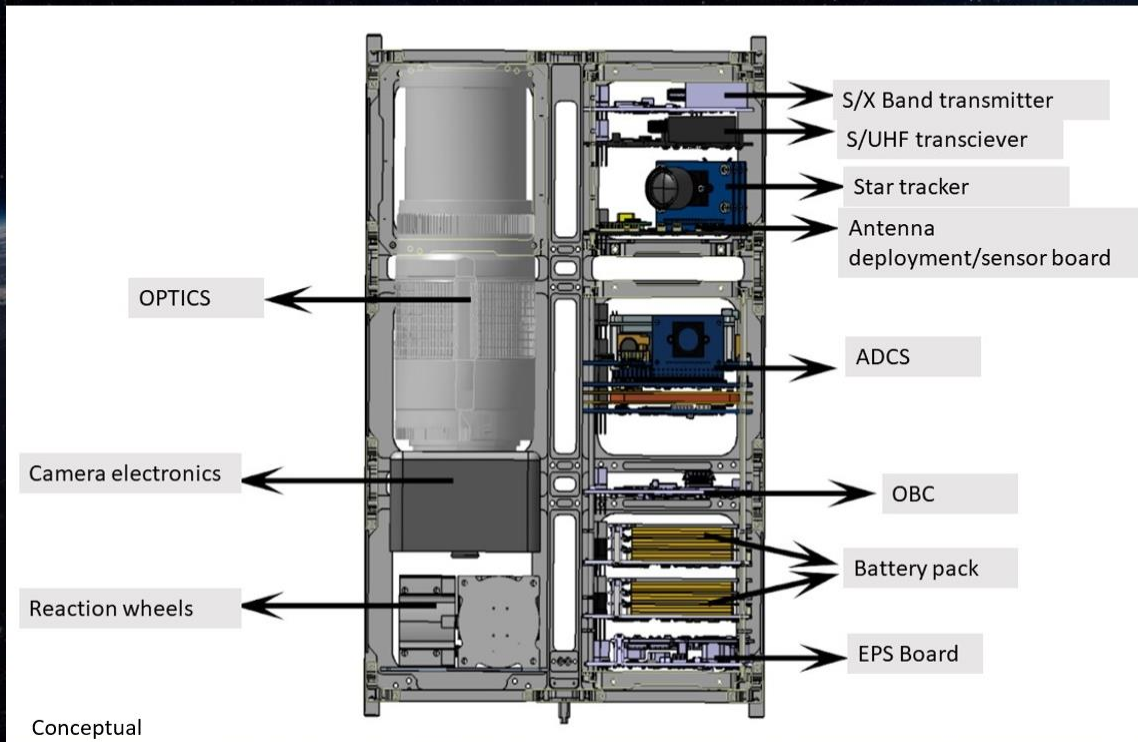


Reference image



CONNECTA T2.1 MISSION

CONNECTA T2.1 is a 6U Cubesat for technology development, test and on-orbit demonstration for the aimed Project.



CONNECTA T2.1 will be a software defined satellite and will serve as a test and development platform.

It will have high resolution multispectral camera to take pictures of the areas under interest.

It will have connectivity with sensor nodes to collect relevant data and ground terminals to share early warning messages.

PARTNERSHIPS

Partner on Satellite Design,
Development & Testing



Istanbul Technical University
Space Systems Design and Test Laboratory

Potential Partner on Multispectral
Cubesat Cameras



Dragonfly Aerospace
Caiman Award Program

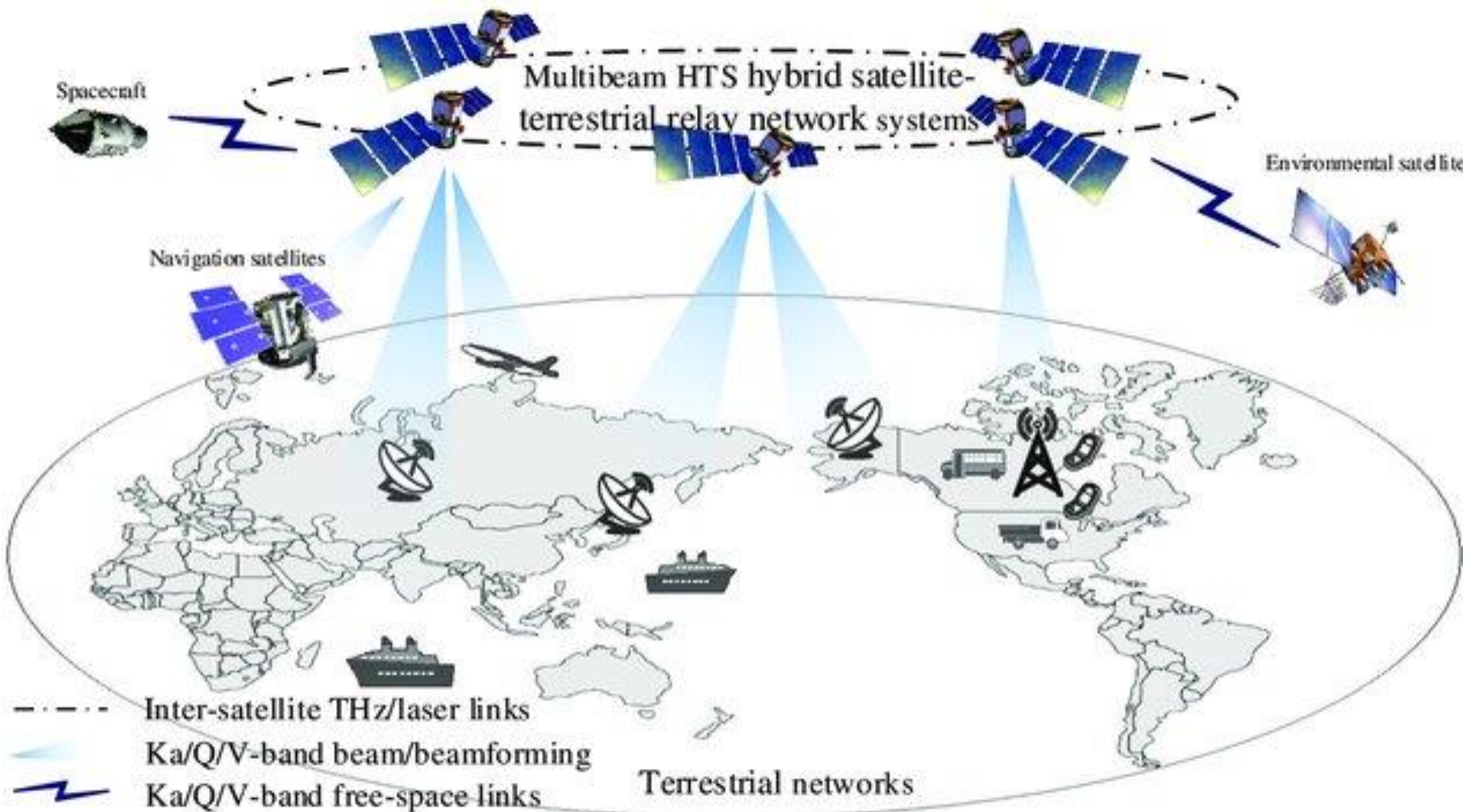


SATELLITE & SPACE TECHNOLOGIES

Potential Partner on Image
Processing & Machine Learning

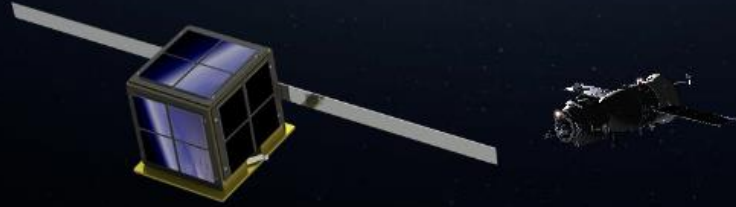


Ihsan Doğramacı Bilkent University
Electrical & Electronics Engineering Dept.



Project.X

Türkiye'nin ilk PocketCube Projesi



grizu-263A (grizuSAT)

grizu-263A (grizuSAT) Türkiye'de üretilen ilk pocketcube projesidir. 5x5x5 cm boyutlarında olacak olan küp şeklinde bu uydunun üretimi tamamen Zonguldak Bülent Ecevit Üniversitesi'nde gerçekleştirilecektir. Proje 2018 yılı CanSat Competition Dünya 2.si olan grizu-263 Uzay Takımı tarafından başlatılmıştır.

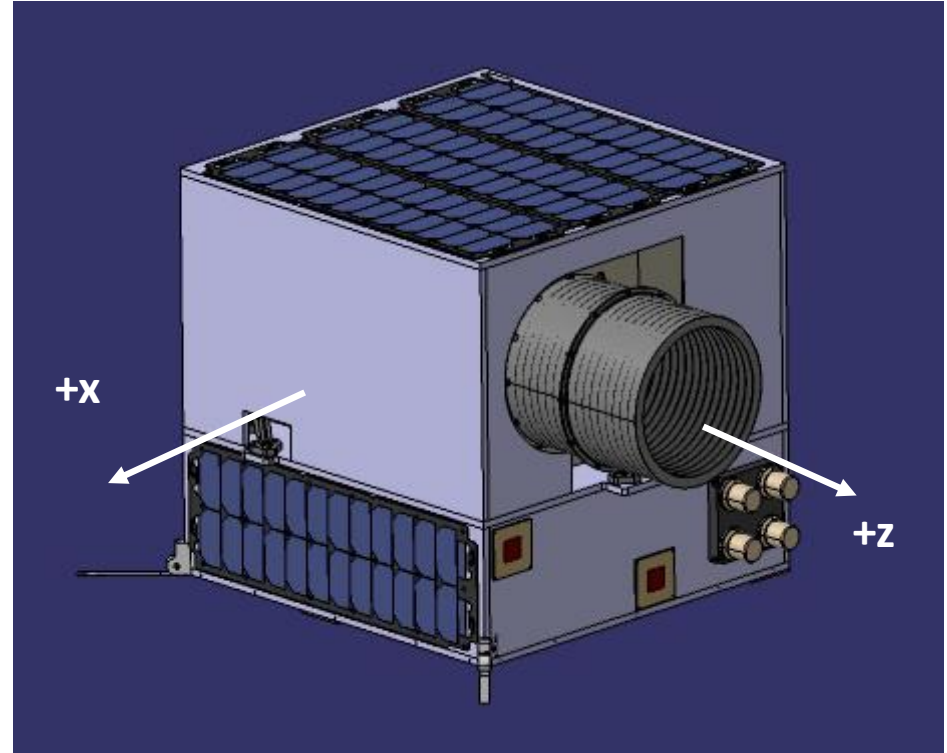
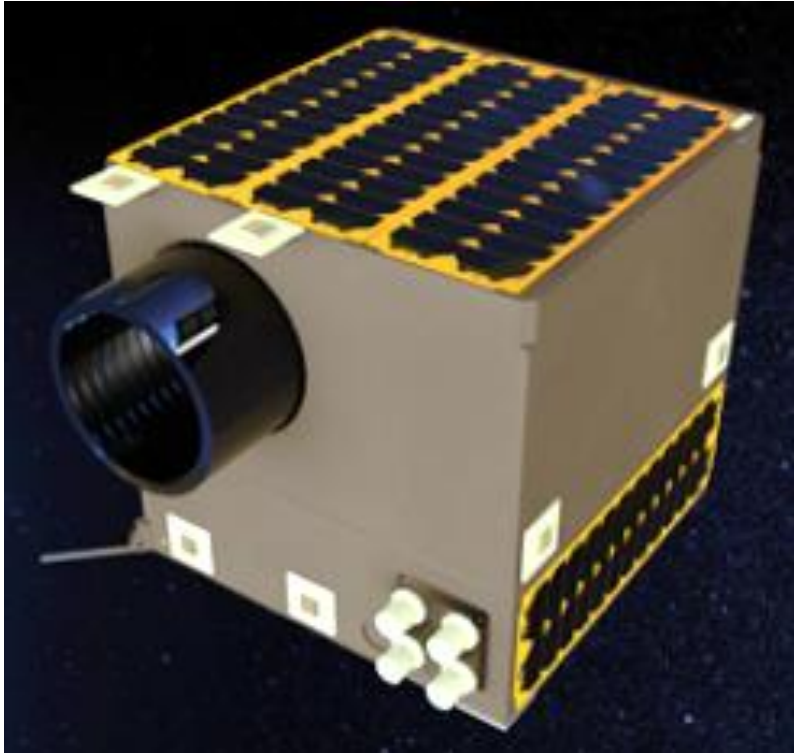
Uydu 2020 yılının ortasında fırlatılacak ve 500 km yükseklikte yörüngeye yerleştirilecektir.



Supporters

TU Delft





Hi Res EO, PAN <2m, MS<8m

Micro Sat, <70kg, operational satellite

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



MODEL UYDU İMALAT EĞİTİMİ VE TASARIMI

III. CanSAT Uygulaması

CanSAT Nedir?
Amerika Birleşik Devletleri'nden dünyaya yayılan bir kavramdır. İngilizce "Can" ve "Satellite" sözcüklerinin birleşiminden meydana gelmiştir. Diğer anlamı ise Model Uydu tanımıdır. Model uydu modern uyduların temeli oluşturan yapıların modellenerek öğrencilere tanıtılması ve merak uyandırması düşüncesiyle bugün Dünya'nın pek çok yerinde yarışması yapılan bir etkinlik türüdür. Gerçek uyduların aksine, boyutları (330 mililitrelik kola şişesi) ve kütlesi en fazla 350 gr olan ve bir araştırma roketi ile çok düşük irtifaya (1000 m den az) çıkarılan minyatür uydur.

CanSAT Temelli Uzun Eğitim Hedefi
Uzun mühendisliği ve bilimleri alanında yetişmiş insan gücünü artırmak amacıyla CanSAT tasarımı ve imalatını bir eğitim aracı olarak kullanmaktır. Türkiye'de CanSAT projeleri gerçekleştirilecek ve uluslararası CanSAT yarışmalarına katılacak kişi sayısını artırmak amacıyla katılımcıları CanSAT tasarımı ve imalatı konusunda uygulamalı olarak eğitmektir. Bu eğitime katılan kişilerin üniversite ve kurumlarına döndükten sonra CanSAT projelerine liderlik ve danışmanlık yapmaları beklenmektedir.

CanSAT Eğitim Adımları
Görev Analizi ve Sistem Geliştirme
Donanım Entegrasyonu
Yazılım Geliştirme
Mikrodenetleyici Programlama
GPS Entegrasyonu
Güneş Paneli Entegrasyonu ve Güç Sistemi
Telemetri Sistemi Entegrasyonu
Alçalma ve İniş Sistemleri Tasarımı
Mekanik Tasarım
Yer İstasyonu Geliştirme
Test ve Fırlatma
Görev Sonrası Veri Analizi

CanSAT Temelli Uzun Eğitimin İçeriği
a. Etkili bir disiplinler arası eğitim aracıdır.
b. Düşük maliyetle proje geliştirilir.
c. Görev analizi yapılarak proje süreçleri planlanır.
d. Tasarım, imalat, test ve fırlatmaya kadar tüm süreç uygulamalı olarak tecrübe edilir.
e. Risk analizleri yapılır.
f. Görev sonu ve analizi yapılır ve görev başını durumu değerlendirilir.

Kimler Katılabilir?
Uzun alanında çalışmak, bilgi sahibi olmak isteyen isteyen HERKES, özellikle savunma sanayii firma yöneticisi ve çalışanları, Mühendislik, Temel Bilimler, Astronomi ve Uzun Bilimleri, Uzun Bilimleri ve Teknolojileri öğrencileri veya mezunları katılabilir.

TARİH
8-15 Ağustos 2016
YER
Yalova Üniversitesi
Mühendislik Fakültesi
Stadyum Karşısı
77200 Yalova



Kurs Ücreti: 1500 TL
Kurs ücreti, kurs dokümanlarını, uygulamalı dersleri, uydunun yapımında kullanılan malzemeleri ve fırlatmayı içermektedir. Konaklama masraflarını içermez.

Sponsorlar:

İLETİŞİM: bkilic@yalova.edu.tr, ali.dursun@yalova.edu.tr
sunay.turkdogan@yalova.edu.tr



5th YEAR

MODEL SATELLITE COMPETITION

ROCKET COMPETITION

FLYING CAR COMPETITION

ENVIRONMENT AND ENERGY TECHNOLOGIES COMPETITION

HELICOPTER DESIGN COMPETITION

JET ENGINE DESIGN COMPETITION

EDUCATIONAL TECHNOLOGIES COMPETITION

BIOTECHNOLOGY INNOVATION COMPETITION

SMART TRANSPORTATION COMPETITION

HIGH SCHOOL STUDENTS POLAR RESEARCH PROJECTS COMPETITION

AGRICULTURAL UNMANNED LAND VEHICLE COMPETITION

TRAVEL HACKATHON

DIGITAL TECHNOLOGIES COMPETITION IN INDUSTRY

UNMANNED AERIAL VEHICLE COMPETITION

SWARM ROBOTS COMPETITION

HETEROGENEOUS SWARM SIMULATION COMPETITION

FIGHTER UAV COMPETITION

TECHNOLOGY FOR HUMANITY COMPETITION

AGRICULTURAL TECHNOLOGIES COMPETITION

ROBOTAXI FULLSCALE AUTONOMOUS VEHICLE COMPETITION

EFFICIENCY CHALLENGE ELECTRIC VEHICLE COMPETITION

UNMANNED UNDERWATER SYSTEMS COMPETITION

ARTIFICIAL INTELLIGENCE IN HEALTHCARE COMPETITION

TURKEY DRONE CHAMPIONSHIP

WORLD DRONE CUP

HACK BLACK SEA

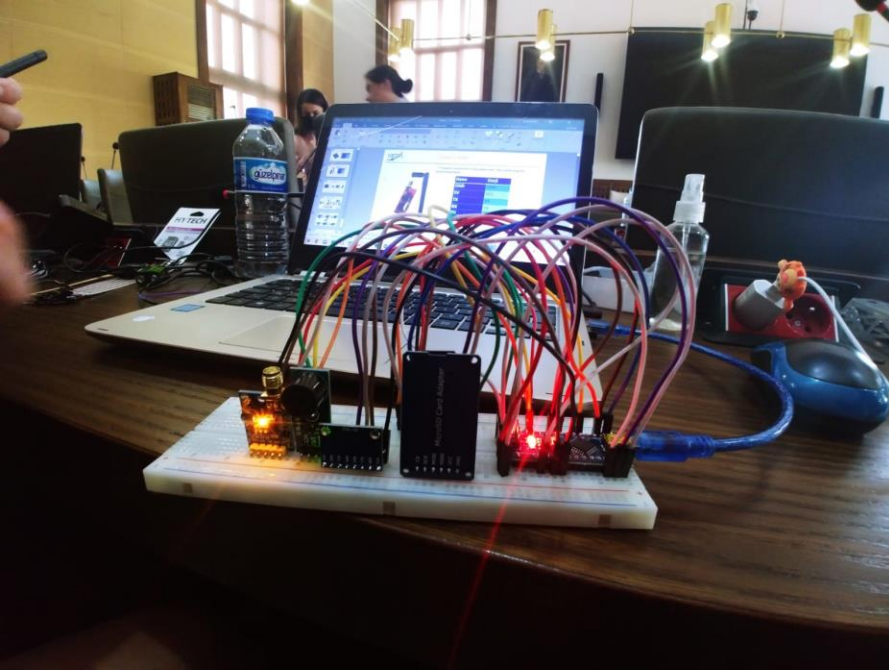
ARTIFICIAL INTELLIGENCE IN TRANSPORTATION COMPETITION

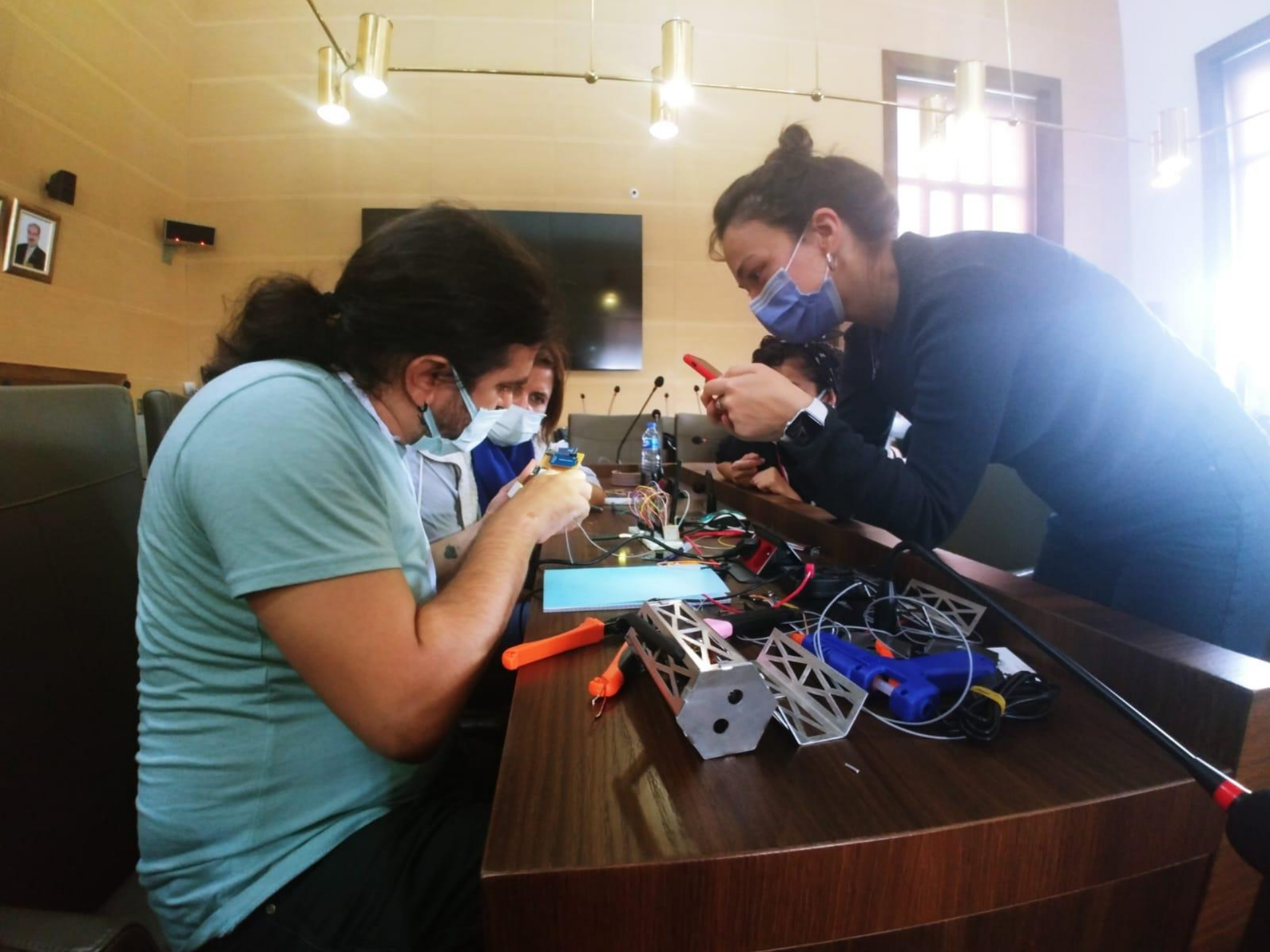
**COME AND JOIN US
IN THE WORLD'S BIGGEST
TECHNOLOGY COMPETITIONS**

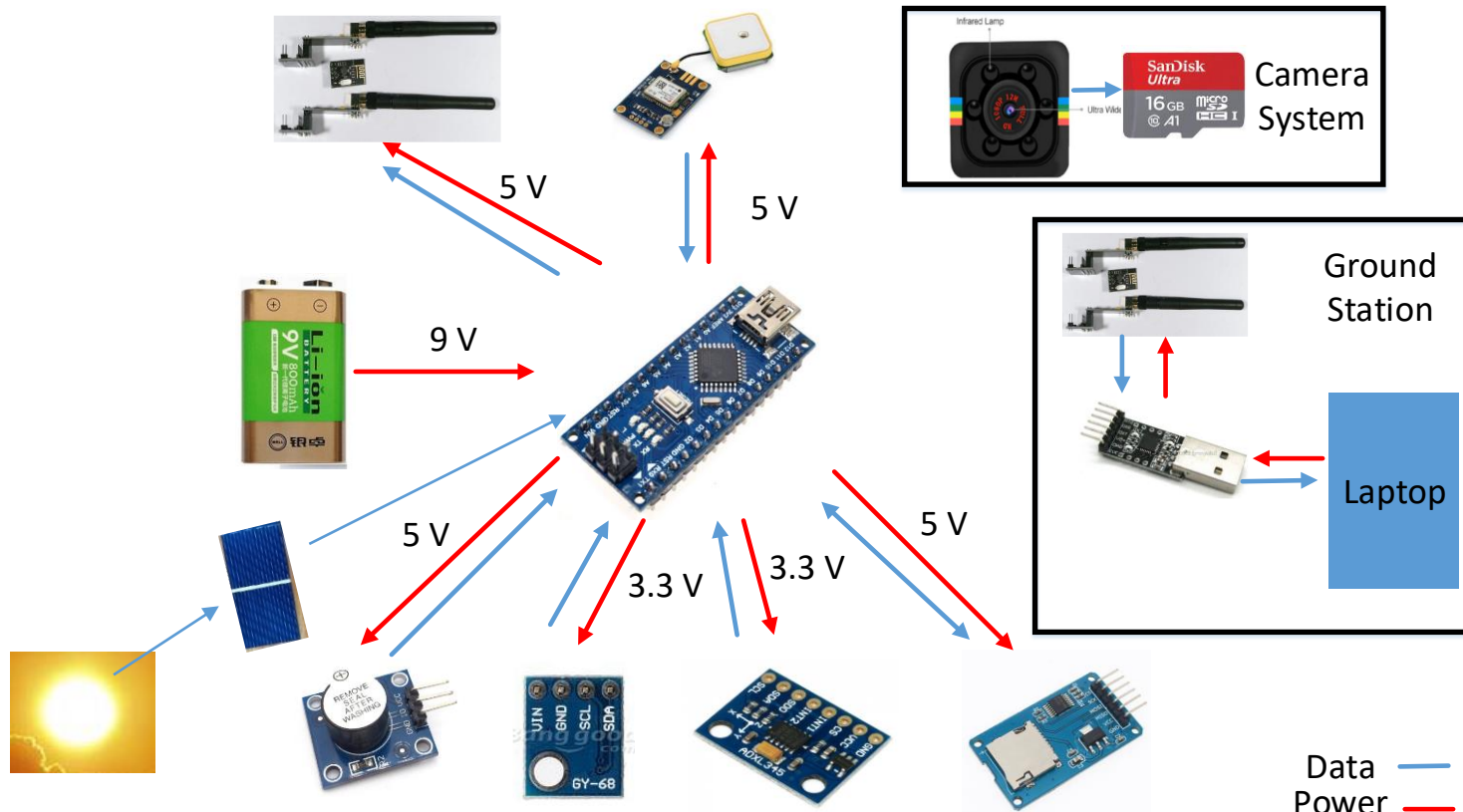
- TURKISH NATURAL LANGUAGE PROCESSING COMPETITION
- PARDUS 21 DEBUGGING AND SUGGESTION COMPETITION
- HYPERLOOP DEVELOPMENT COMPETITION
- ISIF
- ROBOTICS COMPETITIONS
- TAKE OFF INTERNATIONAL STARTUP SUMMIT
- DOCTORATE SCIENCE AWARDS
- TOURISM TECHNOLOGIES COMPETITION
- VERTICAL LANDING ROCKET COMPETITION
- BARRIER-FREE LIVING TECHNOLOGIES COMPETITION
- HIGH SCHOOL STUDENTS CLIMATE CHANGE RESEARCH PROJECTS COMPETITION
- UNIVERSITY STUDENTS RESEARCH PROJECTS COMPETITION









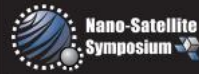


The 11th Nano-Satellite Symposium

The 8th UNISEC-Global Meeting

October 17-21, 2022

Istanbul Technical University, Istanbul, Türkiye



Oct. 17-18, 2022
11th Nano-Satellite Symposium
nanosat11th@itu.edu.tr



Oct. 19, 2022
8th Mission Idea Contest
spacemic.net



Oct. 20-21, 2022
8th UNISEC-Global Meeting
unisecc-global.org



In collaboration with



International
Academy of
Astronautics
(IAA)

Co-hosted by



İTÜ



- UZTED – Turkish German University
 - Space Sciences and technology trainings, seminars to all ages
 - Joint MSc program
- Turkish – Japanese University ??



- The current situation
 - Membership fees? How much? No? Why?
 - Fees are set and accepted by the General Assembly (GA). A small fee has been set but not collected so far. Will be reviewed in next GA.
- Member lists? How to maintain?
 - 23 members, self motivated, being a member is prime motivation
 - Joint activities are critical (Sharjah, planned 2023 activity)
- Mailing list (or SNS, etc) –how to disseminate information and communicate with members?
 - Email and whatsapp group (so far not a problem with 23 members)
- Secretariat – how is the local chapter operated and by whom?
 - Management board (5 members), ARA, MÇ and NC. Nazlı Can is a lawyer managing all legal issues.
- •UNISON (UNISEC Student organization)?
 - Not established yet, however, there are our students helping as needed.
- Chairperson selection - Who will be the chairperson?
 - Current ARA, election on 18th.
- Board committee - Who can make critical decisions?
 - All can. Can meet as needed.
- Annual meeting - Are there opportunities for the members to meet each other?
 - Compulsary: every 2 years in January, others as needed

- Legal status - Can you make a contract with government?
Can you get donations from companies?
 - YES
- Satellite experiment opportunities – Do you offer satellite experiment opportunities?
 - YES
- Do you have a relationship with space agency or government? How can you create or maintain one?
 - YES
- Can you secure financial stability?
 - ??
- Do you offer corporate membership?
 - YES
- Are you promoting practical space Engineering projects?
 - YES

Ministry of Internal Affairs may support some projects of NGO's in accordance with the relevant directive. For the year 2022 the list of the projects to be supported by the government were listed on their official website. According to that lists the projects that are about volunteering, education, disaster awareness and also the projects that are about enhancing the collaboration of NGO's and public, may receive funding from the government. In addition to that NGO's can also receive donations from private entities and real persons. Therefore main income sources of NGO's can be counted as membership fees, donations and governmental funding.



5 YEAR RULE

- Use of suitable orbit (below 550 km)
- Propulsion system usage



We Look Forward To a Fruitful Cooperation

Towards being a civilization living
in the Solar System

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