

UNISEC-Egypt Local Chapter Activity Report

Mohammed Khalil Ibrahim, Ph.D.

UNISEC-Egypt

*Professor, Aerospace Engineering Department, Faculty of Engineering, Cairo University,
Giza, Egypt*

*Professor and Chairman of Aerospace Engineering Department, School of Innovative Design
Engineering, Egypt-Japan University of Science and Technology, Alexandria, Egypt.*

10th Annual UNISEC-Global Meeting, November 27-29, 2024, Stellenbosch, South Africa

Agenda

- Background
- Space Engineering Programs in Egypt
- Acknowledgement of New Member(s)
- Activities
 - CanSat/CubeSat Training Program
 - Space Keys Workshop
 - Capstone Projects
 - CubeSat Partially Funded By Boeing
- Challenges and Future Plan

Background

- UNISEC-Egypt Acknowledged in 2014
 - Aerospace Engineering Department, Cairo University
 - Mechanical Engineering Department, Alexandria University
- CanSat/CubeSat Leader Training Program

Dr. Mohammed Khalil Dr. Ahmed Rashed



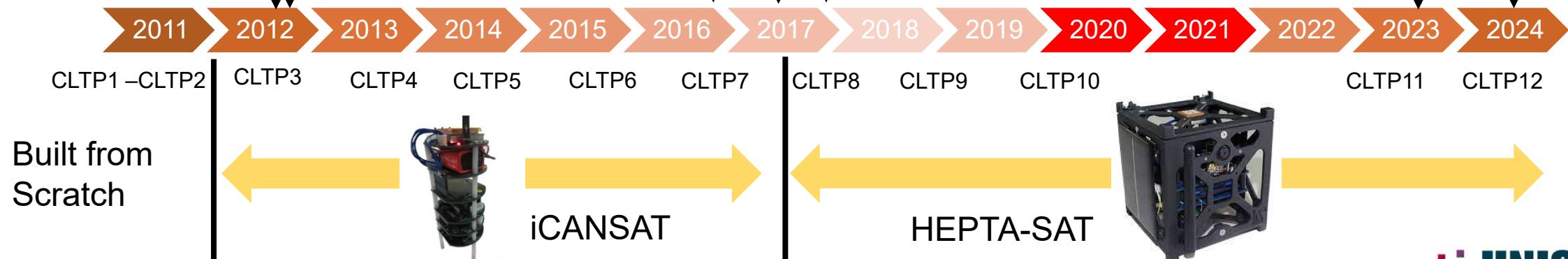
Dr. Ayman Hamdy



Dr. Khaled Youssef



Dr. Mohamed Lotfy




Background

- Establishment of Space System Technology Laboratory in 2011
 - Student-Based Laboratory supervised by Faculty
 - Offer
 - CanSat/CubeSat Training Program (Annually)
 - Rover Training Program (Ad-Hoc)
 - Capstone Project related to Space Engineering
- FabLab






Background

- Mission Idea Contest
 - MIC1, MIC2, MIC3, MIC5, and MIC6
- ARLISS
 - 2014, 2015, and 2019
- UNISEC-Global Meeting
 - 1st, 2nd, 3rd, 4th, 5th, 6th, 8th and 9th
- UNISEC-Global Virtual Meeting
 - 27th Virtual Meeting on November 22, 2022
 - Contribute 49th Virtual Meeting, September 21, 2024
 - Moderate 50th Virtual Meeting, October 19, 2024



27th Virtual UNISEC-Global Meeting

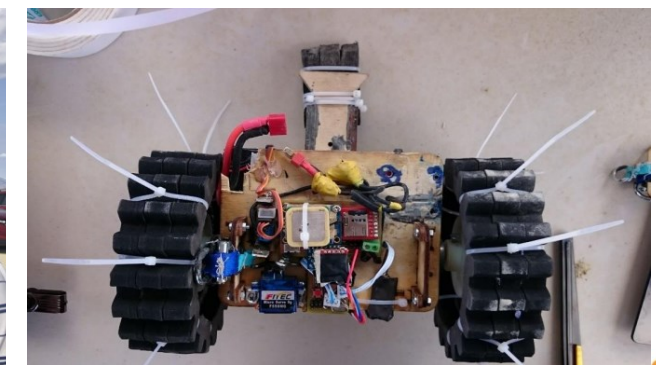
Moderator: Prof. Mohammed Khalil Ibrahim, Cairo University

	Prof. ATEF O. SHERIF Former Chairman of National Authority for Remote Sensing & Space Sciences (NARSS)	TOPIC Capacity Building in Developing Countries
	Prof. MOHAMED B. ARGOUN Professor of Space Dynamics and Control, Dept. of Aerospace Engineering, Former Director of Egyptian Space Program	TOPIC Transfer of Space Technology to Developing Nations
	Prof. MOHAMED B. ZAHARAN Chairman of National Authority for Remote Sensing & Space Science (NARSS)	TOPIC The role of NARSS in building up Egyptian Space Program. Case studies NARSSCube Satellites and NARSS Experimental Satellites.

THEME
"Space Education, Transfer of Technology, and Capacity Building in Developing Countries"

Host: UNISEC-EGYPT
Time: 22:00-24:00(JST)
November 19, 2022

Register here! <http://www.unisec-global.org/virtual-meeting.html>



Space Engineering Programs in Egypt



- **Until 2013**
 - Aerospace Engineering, Cairo University



- **As of 2023**
 - Faculty of Navigation Science and Space Technology- Beni Suef University



- **As of 2024**
 - Aerospace Engineering Program, Egypt-Japan University of Science and Technology (E-JUST) with partnership with Aeronautics and Astronautics Department of Kyushu University



- Aerospace Engineering Program, Zewail City of Science and technology



- Aero-Spacecraft Engineering Program, Zagazig University



Acknowledgement of New Member(s)

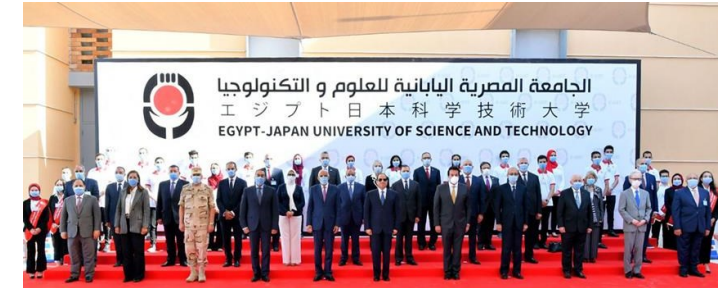
Egypt-Japan University of Science and Technology (E-JUST)

- Established in 2010, as a JICA project between the Egyptian government and Japanese government.
- In 2010, M.Sc. And Ph.D. Programs were launched in
 - School of Electronics, Communications and Computer Engineering (ECCE)
 - School of Energy Resources, Environmental, Chemical and Petrochemical Engineering (EECE)
 - School of Innovative Design Engineering (IDE)
 - Institute of Basic and Applied Science (BAS)
- In 2017, undergraduate programs were launched in the above schools in addition to
 - Faculty of International Business and Humanities (FIBH)
 - Computer Science and Information Technology Programs
 - Sustainable Architecture Program
 - Pharm D Program
 - Art and Design Program



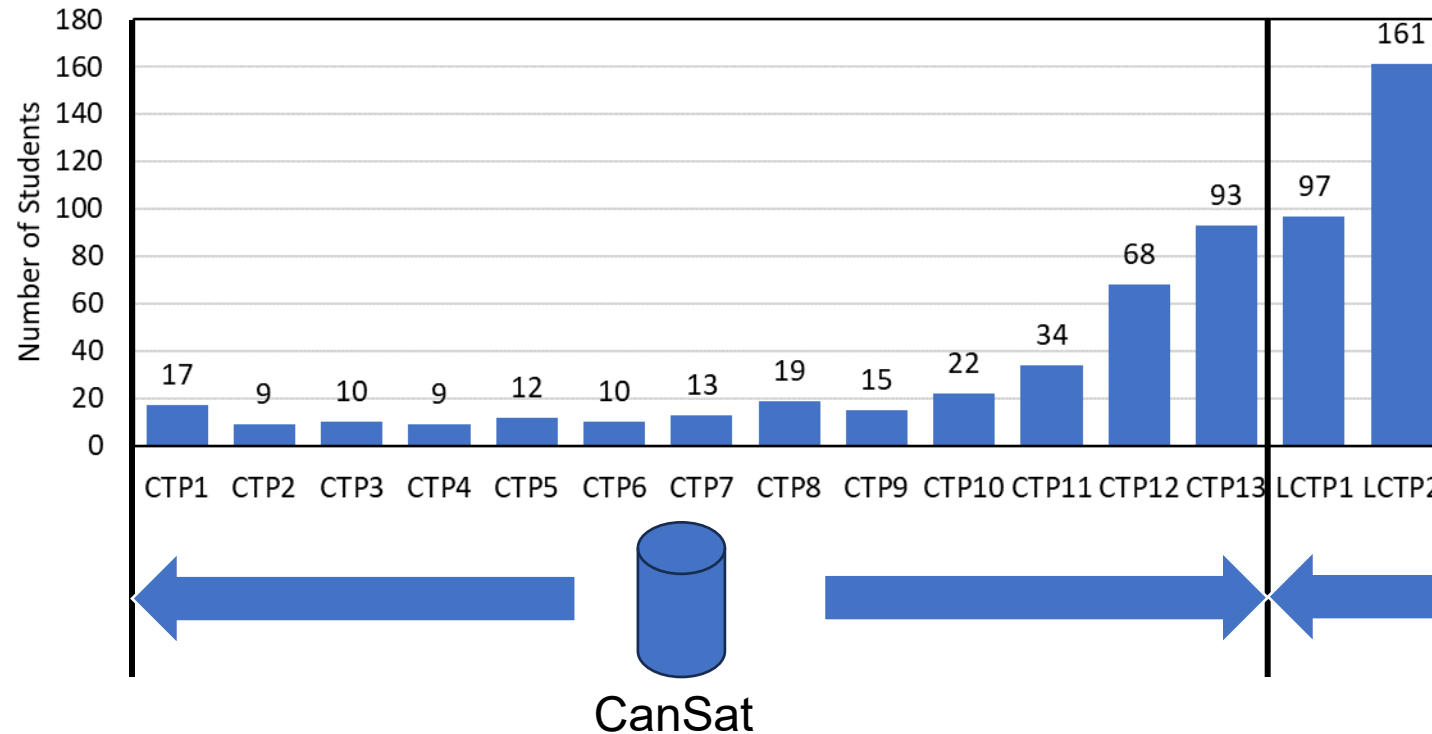
Acknowledgement of New Member(s)

- In 2023, **Aerospace Engineering Department** was launched within the School of Innovative Design Engineering (IDE).
- Currently the number of Undergraduate students is around **5000** students.
- M.Sc. and Ph.D. students is around **450** students with around 30% African Students sponsored by JICA and Egyptian MOHE.
- In 2024, E-JUST is ranked the **top research university** among all Egyptian Universities according to Times Higher Education (THE) World University Rankings.
- Additionally, E-JUST is ranked **#19** globally for SDG#7 (Affordable and Clean Energy), **#21** for SDG#6 (Clean Water and Sanitation), and **#38** for SDG#13 (Climate Action)
- Overall, E-JUST is ranked among the top **401-600** universities globally.
- Recently, E-JUST has been shortlisted by the Times Higher Education Arab World 2024 Awards Committee as one of the leading Arab universities in supporting entrepreneurship



Activities: CanSat/CubeSat Training Program

- Offered annually since 2011
- Since 2022, it has adapted a similar platform to Hepta-Sat

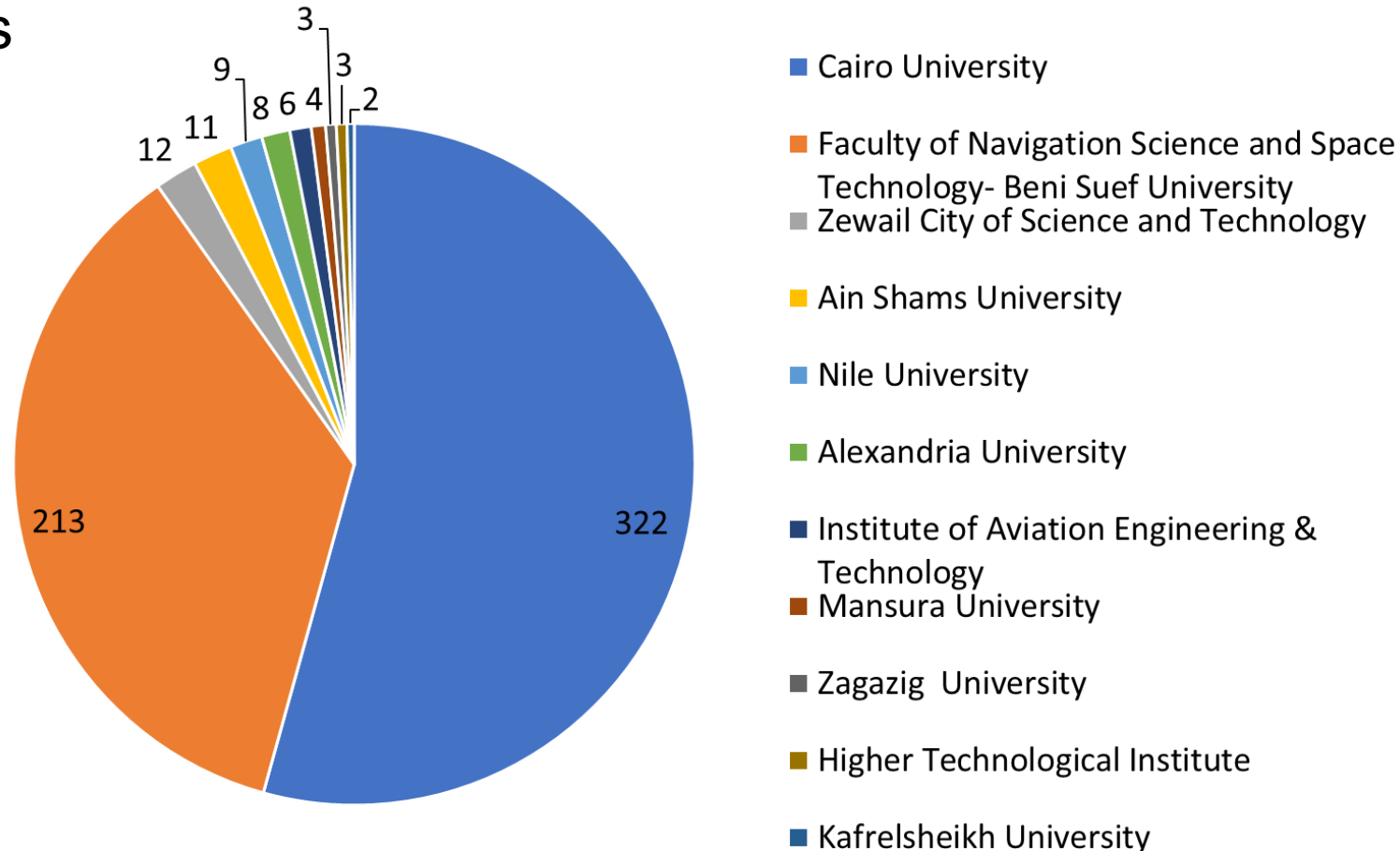


Lean CubeSat

CanSat

Activities: CanSat/CubeSat Training Program

- As of 2024, training was offered to 593 students from 11 Egyptian Universities



LCTP2 (2023)

- Venue: Cairo University
- Date: August 20 – September 20, 2023
- Number of Participants: 161 Students



LCTP3 (2025)

- LCTP3 was not conducted in 2024 due to:
 - Adoption of new bylaws which was effective from summer 2024.
 - Difficulty to procure the required hardware with the available budget due to currency devaluation by (70%)
 - Current plan is to conduct the LCTP3 in January 2025.

Activities: Space Keys Platform Workshop



Space Keys

We're Unlocking the Space for Everyone



Space Science & Technology Related Colleges
And High Schools



25 Universities (32 Faculties)
1 School



5 Countries



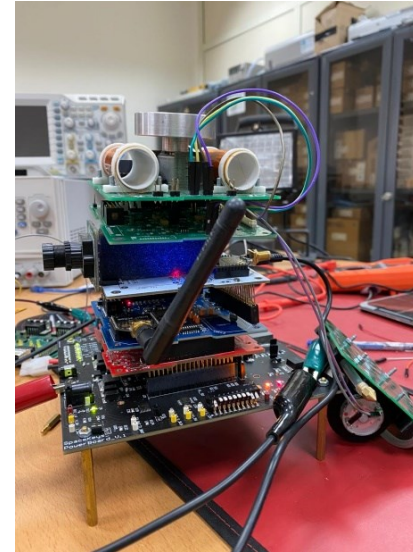
40 Kits



2021



Workshop, Feb, 2023



Activities: Competition and Exhibitions 2024



Participate in Cairo University's Project Fair, 2024

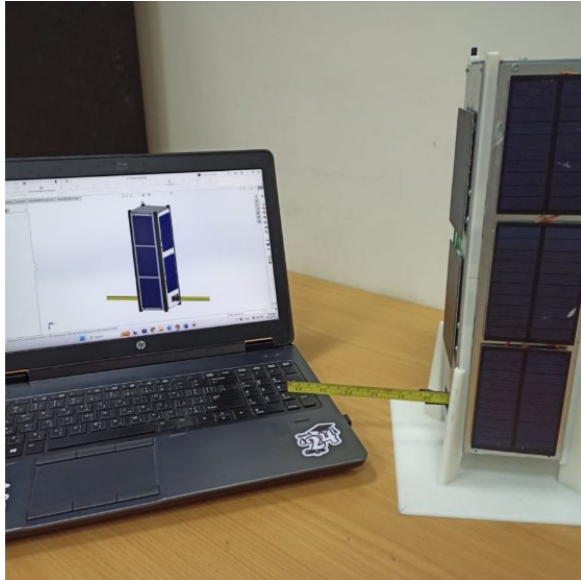


Participate in YLF, 2024 Edition



Won the 6th place out of 150 participated team in "AKKRUTI Global 2024"

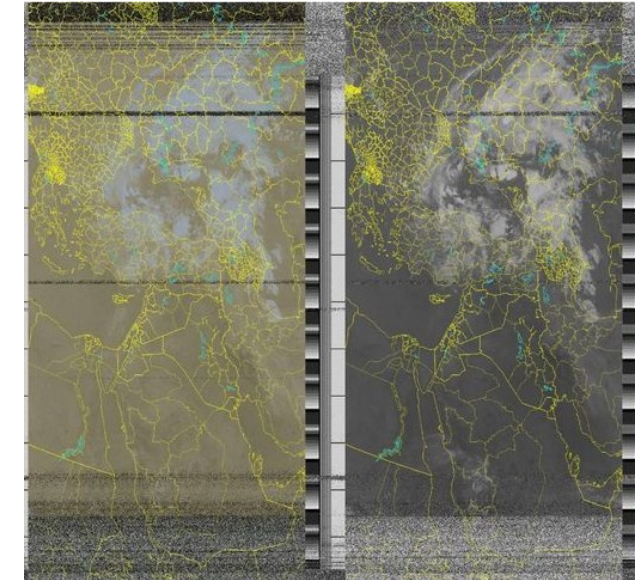
Activities: Capstone Projects - 2024



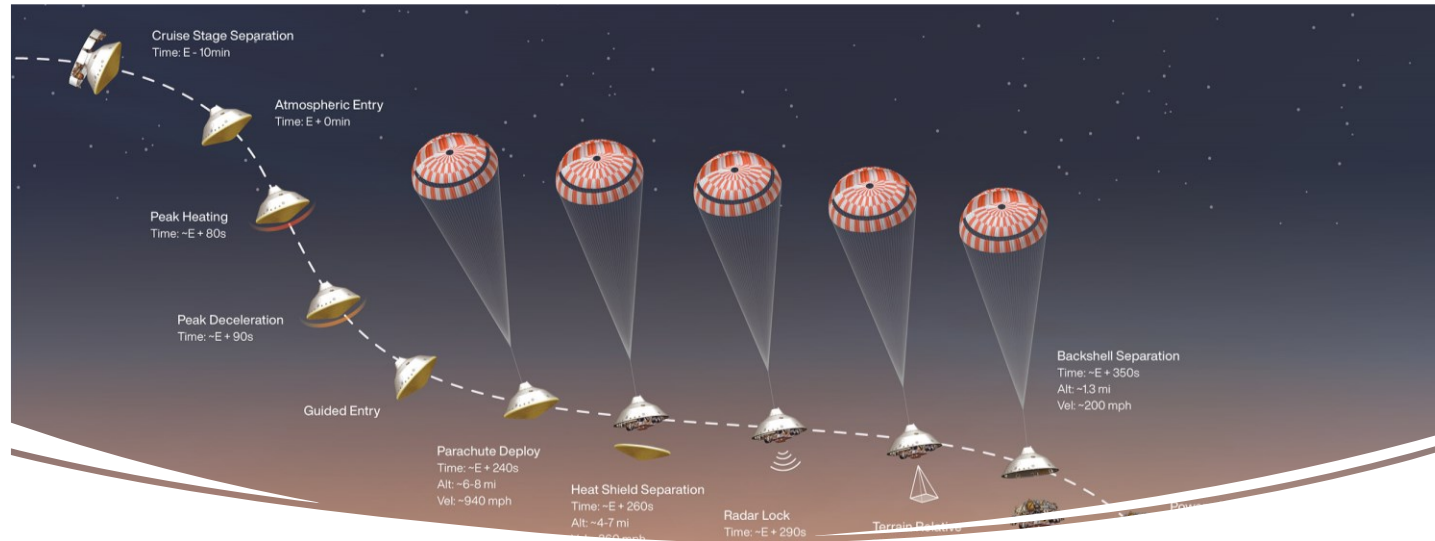
3U CubeSat For Earth Observation



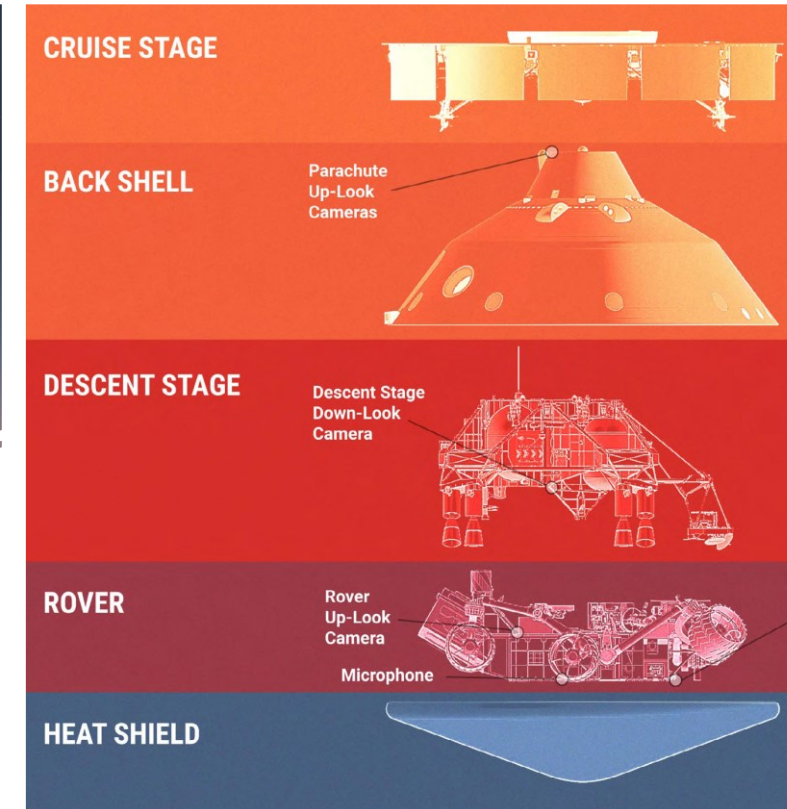
Open-source Satellite tracker & Ground Station



Activities: Capstone Projects - 2024



Conceptual Design of Mars Lander Mission: Digital Twins Approach



NASA Mars 2020 Model

Activities: Capstone Projects - 2024



Aerial Airport Firefighting Quadcopter



Airborne Ground System for Surveillance and Transportation



CubeSat Project Partially Funded by Boeing

Aerospace Engineering Department Joined Boeing University Program in 2017

Boeing agreed to allocated percentage of funding to develop a CubeSat for aviation applications since 2020.

2017

2018

2020

2022

New Program named “Aviation Engineering and Management” launched in 2018 and partially funded by Boeing.

Preliminary design of the CubeSat started in 2022.



Boeing MENAT President Mr. Bernard J. Dunn, 2018

Joint HEPTA-Sat Workshop in 2025

- UNISEC-Egypt & E-JUST
- Date: TBD (July 2025)
- Expected Number of Participants: 20 Professionals

Challenges and Future Plan

- Challenges
 - Lack of funding
 - There is no dedicated administrative staff
 - Brain drain
- Future Plan
 - Invite Zewail UST and Zagazig University to Join UNISEC-Egypt.
 - Hold UNISEC-Egypt general meeting sometime next year
 - Conduct LCTP3 and Space Keys training workshops in January 2025.