



# National Space Program and Turkish CubeSat Missions

International «Low Earth Orbit» Cube and Small Satellite Conference and Seminar  
Ankara, Türkiye

14 December 2023

# National Space Program

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Moon Research Program



Unification of Satellite Production Under a Single Framework and Indigenous Satellite Development Program



Regional Navigation and Timing System (BKZS)



Access to Space and Spaceport



Technological Research on Space Weather



Observation and Tracking of Space Objects from the Ground



Development of Space Industry Ecosystem



Establishment of Space Technologies Development Region



Space Awareness and Human Resource Development



Turkish Astronaut and Science Mission



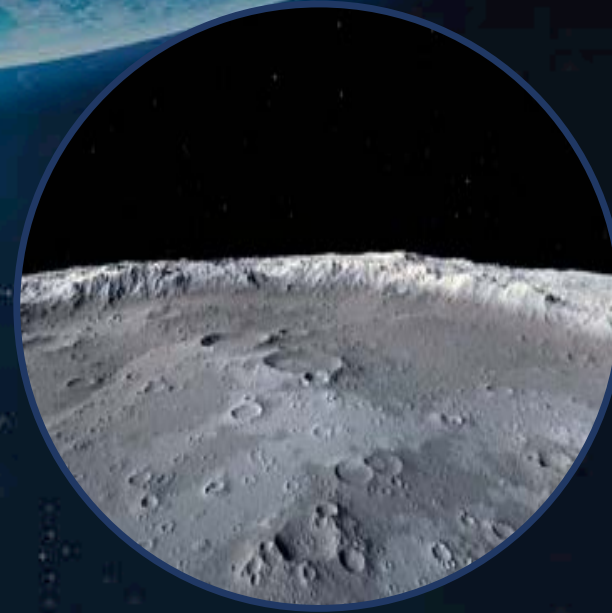
# Moon Research Program

## First Stage

- ✓ Rough landing
- ✓ National and authentic hybrid rocket
- ✓ Launch to orbit through international cooperation

## Second Stage

- ✓ Soft landing
- ✓ Launch with domestic launcher



# Unification of Satellite Production Under a Single Framework and Indigenous Satellite Development Program

- ✓ Merge Satellite Production Activities Under One Single Authority
- ✓ Create an internationally competent brand on new-generation satellite production and development
- ✓ Program for Developing National Satellites





# Regional Positioning and Timing System

- ✓ Upgrade and Integration of existing positioning infrastructures (such as CORS-TR).
- ✓ Establishment of an SBAS (Satellite Based Augmentation System)
- ✓ Establishment of a regional positioning and timing system (BKZS)
- ✓ Developing a space qualified atomic clock and testing in orbit.



# Access to Space and Spaceport

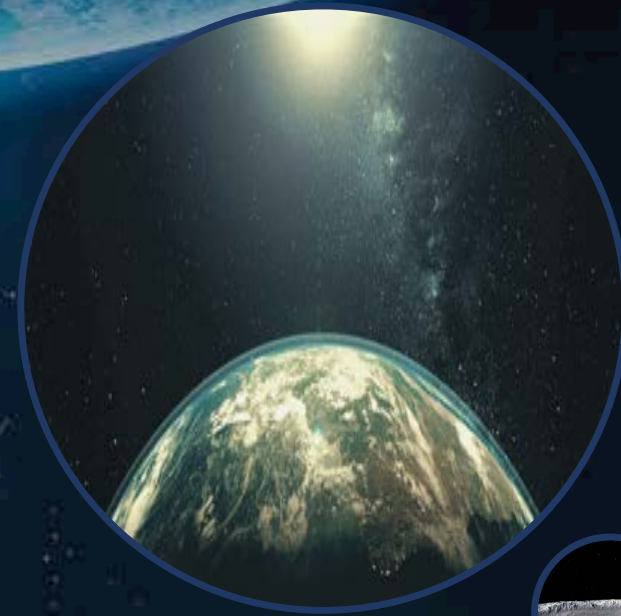
- ✓ Ensure access to space
- ✓ Establish a spaceport administration
  - ✓ Selection of launching area
  - ✓ International collaboration opportunities
- ✓ Develop a Launch System
  - ✓ New generation rocket propulsion technologies
  - ✓ Small satellite deployment capability





# Technological Research on Space Weather

- ✓ Promote research on space weather and meteorology
- ✓ Integrate space weather data to radiation tests and improve radiation hardened satellite components
- ✓ Establish a department/center to analyze space weather observations





# Observation and Tracking of Space Objects from the Ground

- ✓ Observing and Monitoring Space Objects from the Earth
- ✓ Increasing Turkiye's efficiency in terms of
  - ✓ Astronomical observations
  - ✓ Tracking space objects from the Earth
- ✓ Integration of biggest observatories in Turkiye
  - ✓ TUG (TUBİTAK National Observatory)
  - ✓ DAG (East Anatolian Observatory)



# Development of Space Industry Ecosystem

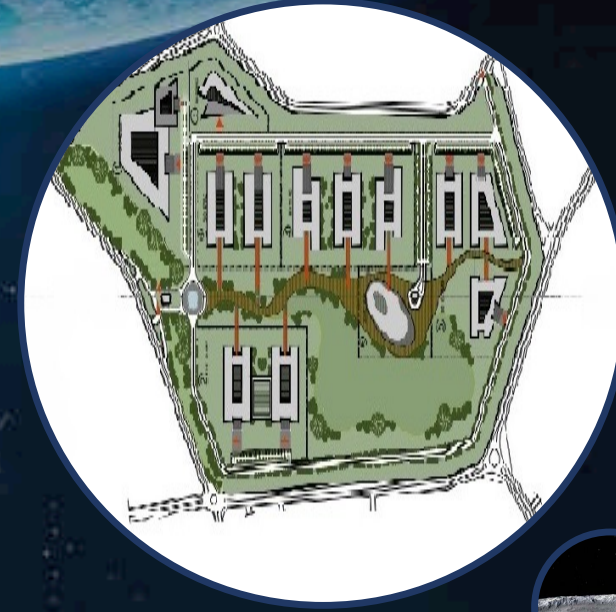
- ✓ Develop space industry ecosystem
- ✓ Improve and increase the space economy
- ✓ Sustainable Space Industry





# Establishment of Space Technologies Development Region

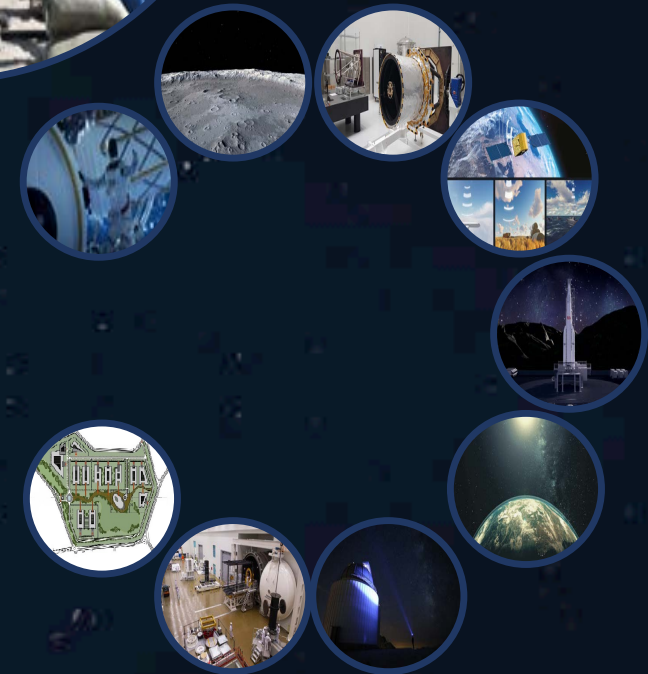
- ✓ Establish a Technology Development Region
- ✓ TUA headquarters will be located in that Technology Development Region





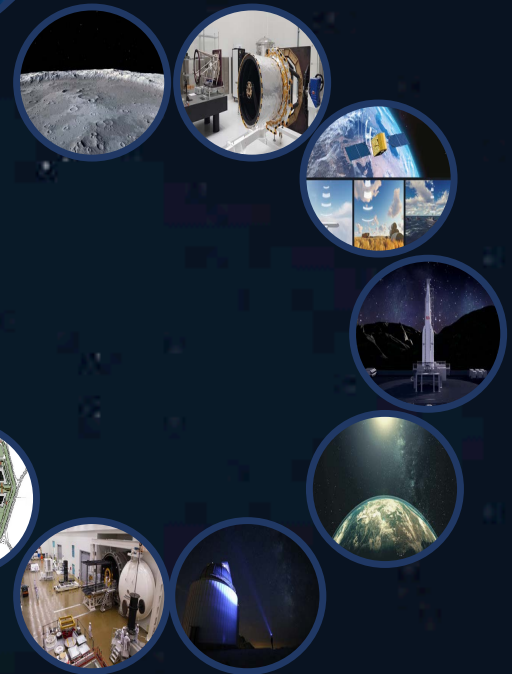
# Space Awareness and Human Resource Development

- ✓ Promote space technology awareness in public
- ✓ Develop effective and competent human resources in the field of space



## Turkish Astronaut and Science Mission

- ✓ 2 Astronaut candidates were selected.
- ✓ Scientific experiment selection process was completed.
- ✓ 2 candidates having
  - ✓ Astronaut training program
  - ✓ Experiment specific training
- ✓ A Turkish astronaut will go to ISS.
- ✓ 13 scientific experiments will be conducted.





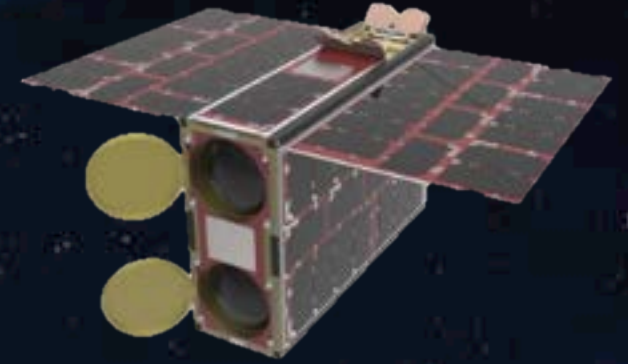
# Turkish CubeSat Missions



Name	Launch Date	Category
İTÜpSAT1	2009	Experimental
TÜRKSAT 3USAT	2013	Amateur Radio Communication
BeEagleSat	2017	Scientific
HAVELSAT	2017	Scientific
UBAKUSAT	2018	Amateur Radio Communication
ASELSAT	2021	Experimental
Grizu 263A (PocketQube)	2022	Experimental
Connecta T1.1 and T1.2	2022	IoT
Connecta T2.1	2023	IoT / Remote Sensing
KILIÇSAT	2023	AIS
SSS-2B	2023	Remote Sensing
İstanbul (PocketQube)	2023	IoT
Hello Test 1, 2 (PocketQube)	2023	IoT
Connecta T3.1 , T3.2	2023	IoT/ISL

# Turkish Science CubeSat Astronaut Mission and (TABM)

- ✓ 6U CubeSat
- ✓ Super Resolution
- ✓ Domestic Optical Components
- ✓ Optical electronics will be developed for the payload



## Atomic Clock CubeSat

- ✓ Development of Rb Atomic Frequency Standard (RAFS)
- ✓ Integration of RAFS to the 6U CubeSat developed for the atomic clock mission.
- ✓ Testing atomic clock in LEO
- ✓ Having experience on atomic clock operations on orbit
- ✓ Gain space heritage to the atomic clock.





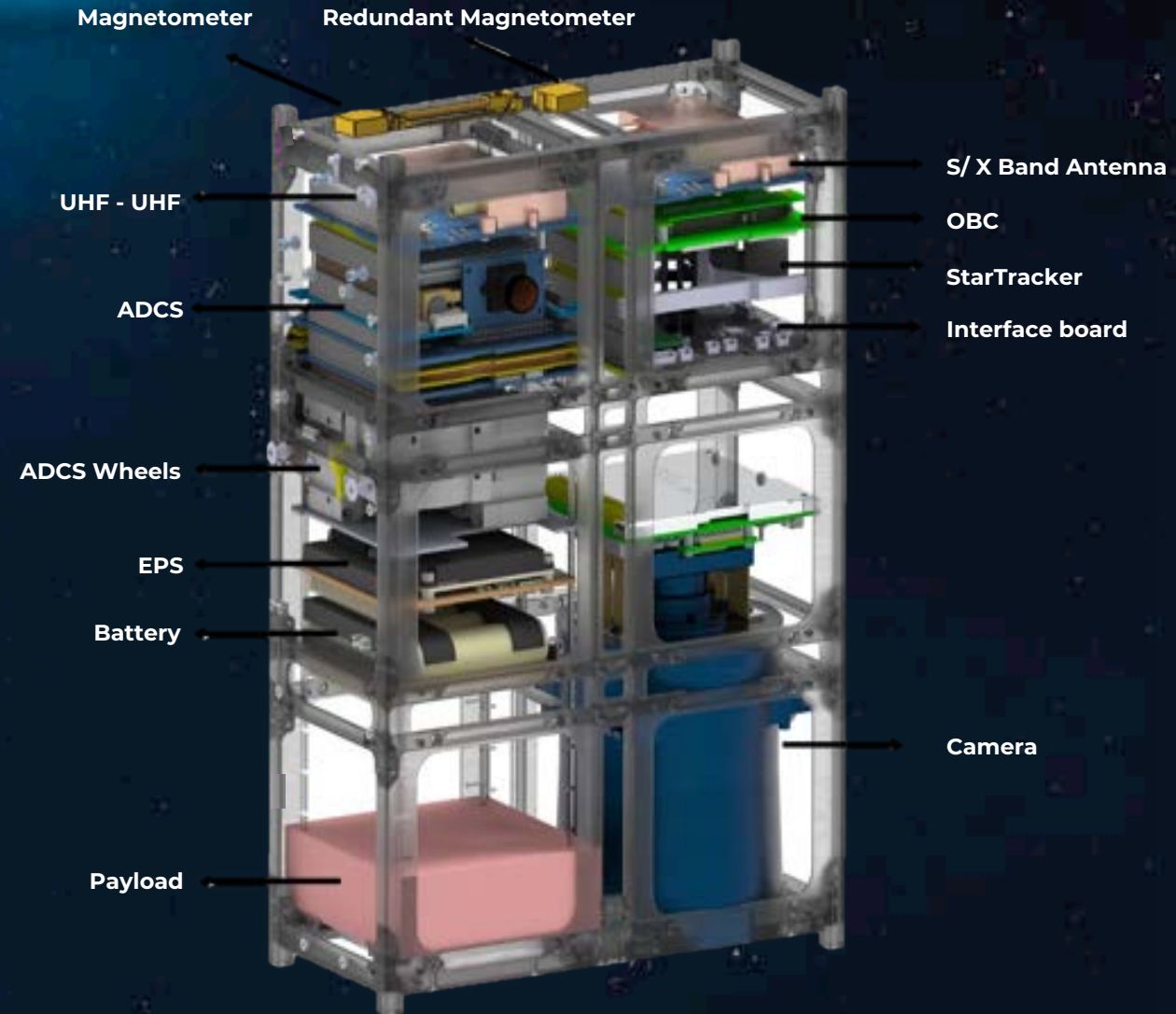
# Organization of Turkic States CubeSat

## Remote Sensing

- ✓ Agricultural activities will be monitored
- ✓ Data accuracy will be checked

## GPGPU

- ✓ Images can be processed on satellite
- ✓ Different image processing algorithms can be uploaded to the satellite and tested





**Thank You**

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