The 11th UNISEC-Global Meeting

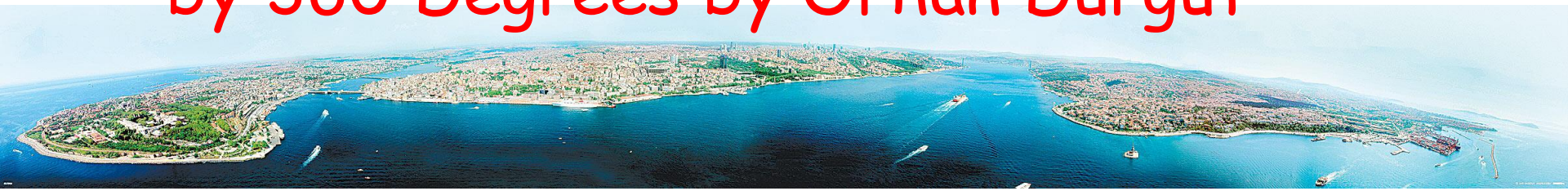
Koshiba Hall, The University of Tokyo, Japan
2 Nov 2025

Panel Discussion
—Long-term Sustainability of Nano/Micro Satellite Activities

Moderator: Mengu Cho, Kyushu Institute of Technology and Chiba Institute of Technology
Panelists:
Kenichi Sato, JAXA
Alim Rustem Aslan, Istanbul Technical University
Hiraku Sakamoto, Institute of Science Tokyo

İTÜ, Istanbul, Türkiye

by 360 Degrees by Orhan Durgut



With a history stretching back almost 252 years (1773), providing technical education within a modern educational environment and strong academic staff, **Istanbul Technical University (İTÜ) is strongly identified with architectural and engineering education in Turkey**

- **Department of Astronautical Engineering since 1983**

ITU/FAA
Faculty of Aeronautics and Astronautics

Space Systems Design and Test Laboratory

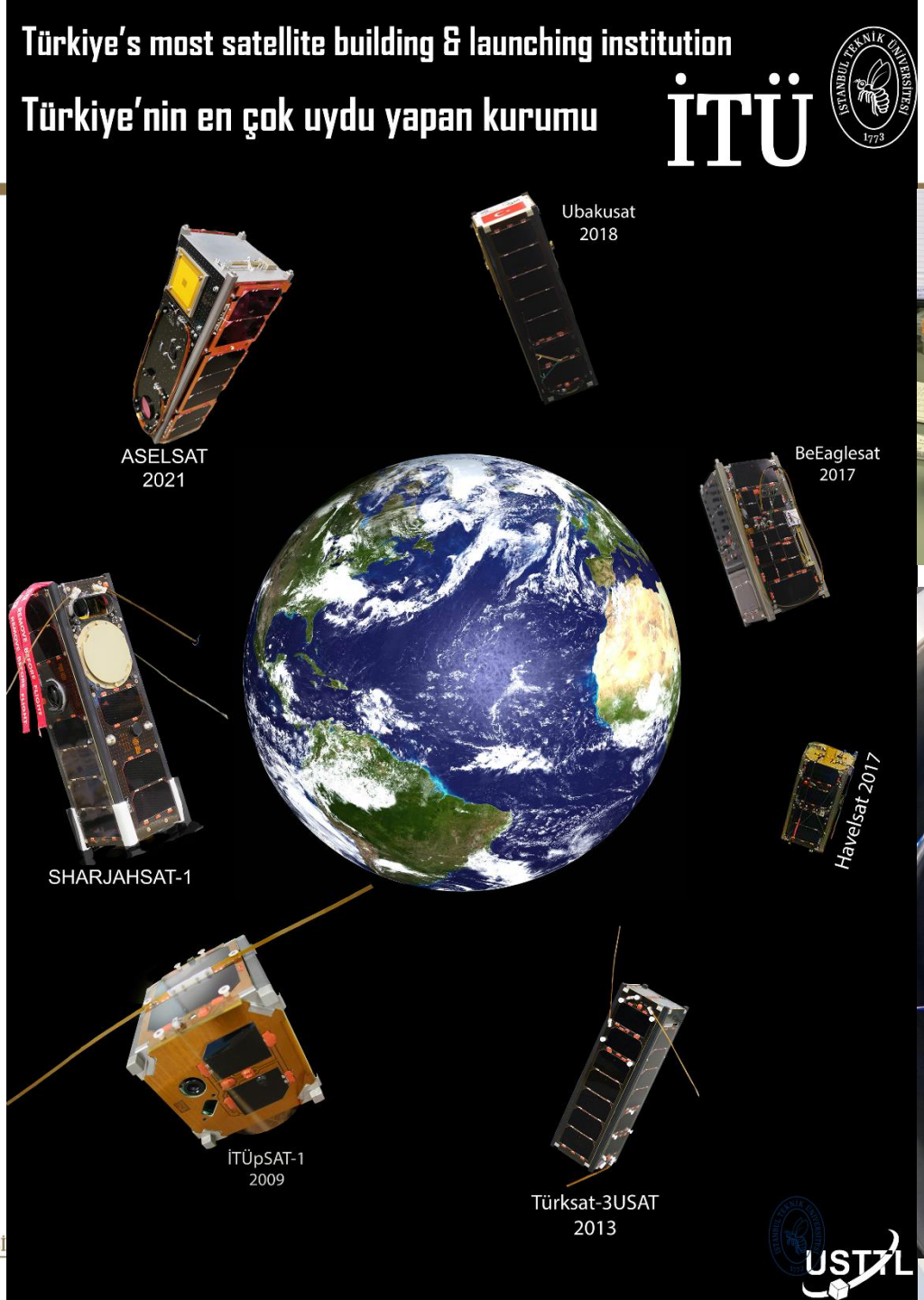
USTTL

Prof.Dr. Alim Rüstem ASLAN

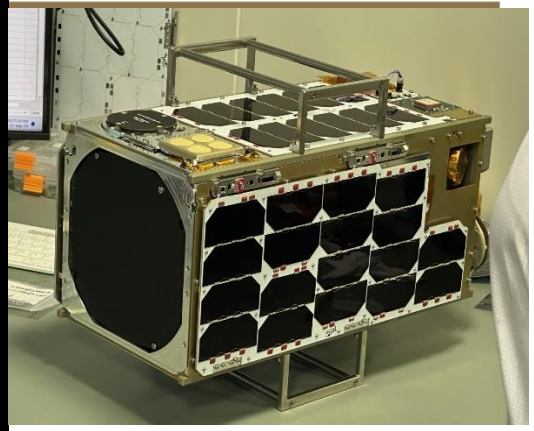
Astronautical Engineering Department
Istanbul Technical University, Turkiye
National Defense University, Turkiye

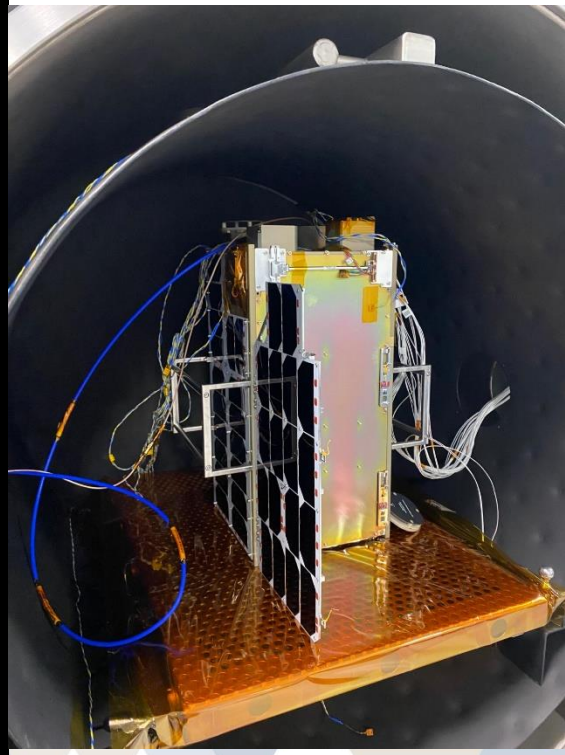
- Manager and founder, Space Systems Design and Test Laboratory
- Manager and founder , SmallSat Communication Laboratory
- International Academy of Astronautics, Member
- UZTED, President
- UNISEC-GLOBAL SC Member
- NATO CSO-STO AVT National Panel Member
- TA1ALM

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.**



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





UNITED NATIONS
OFFICE FOR OUTER SPACE AFFAIRS

GUIDELINES FOR THE LONG-TERM SUSTAINABILITY OF OUTER SPACE ACTIVITIES OF THE COMMITTEE ON THE PEACEFUL USES OF OUTER SPACE

UNITED NATIONS

İTÜ

- **How does the LST affect nano-satellite programs especially in universities and emerging countries?**
- **What are the necessary technological breakthrough to live with LST?**
- **What should UNISEC-Global do to live with LST?**

How does the LST affect nano-satellite programs especially in universities and emerging countries?

- LST requirements lead to more complex and expensive systems
- Propulsion cost
- Lower TRL studies

What are the necessary technological breakthrough to live with LST?

- Conduct science/engineering to provide input for affordable Engineering solutions
- Plug and play systems and architecture
- AI based performance increase
  - Exact trajectories and DV calculation leading to min propellant
  - Smart manoeuvring
  - Better Power management to optimize power system
  - Data management
  - Comm management
  - Autonomy

- Water based Propulsion
- Higher thrust EP

- Defy gravity, new Technologies to acces space and to move about planets
- Systems to collect failed SC

ITU-SSDTL 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

What should UNISEC-Global do to live with LST?

- Suport work on breakthrough Technologies
- Continue international collaborations
- Provide guidence and ready to use affordable subsystems

We Look Forward To a Fruitful Cooperation

Towards being a civilization living in the Solar System

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