

Local Chapter Activity Report

at the 50th UNISEC–Global Meeting



UNISEC – BULGARIA

Nikolay Tomov

UNISEC – Bulgaria PoC, CASTRA Board Member

BULSIM Chairman

SEE Operations Chair

History of Local Chapter Activities

- Established in 2018 legally managed by  *
- Adopted Guiding Principles of UNISEC-Global
- Follows the Vision of UNISEC-Global

- *Participated in MIC in 2012, 2016, 2019*
- *Attended UNISEC-Global Meeting in 2013, 2016, 2017, 2018, 2019, 2021*
- *Participated in CLPT8*
- *Organized MIC Seminars, Workshops in 2012, 2013, 2016, 2018*
- *Held CanSat/HEPTA-Sat Training Program/Competition in 2016 and 2017*

* **Cluster AEROSPACE TECHNOLOGIES, RESEARCH AND APPLICATIONS (CASTRA)** is an industry driven non-government organization – cluster, consortia of technology driven SMEs, Academic and research organisations and other professional NGOs, all developing technologies, products and services in the aerospace domain.



RADIATION HARD ASIC Design & Test
System on a digital Chip

MEMS Sensors and actuators

GNSS tracking solutions

Moon base greenhouse simulation study

Embedded IoT systems

High-reliability digital electronic systems
discharges and over-voltages

EMP - phase E1 and E3 of Nuclear explosion

50,000V/m for 200ns - E1
2kV for 20-200nsec - E3

3-12 GHz - 10kW
500ns pulses - 10MW

UAV systems

Example of a federated modeling and simulations of space infrastructure & virtual reality tools

Vertical takeoff and landing Low profile disc shaped UAV

Satellite communication systems
Jet UAV shooting targets

RF systems design

MW Antennas

Dron detection and counter measures system
Visual-MWIR camera, laser range finder, spectral analyzer, jammer

Multi-spectral camera prototype with integrated high-speed downlink
& missions design. EO imaging and data comm payload development

carbon fiber products for automotive, space, robotics, consumer

FMCW panoramic drone radar

Design & manufacturing of specialized equipment and industrial systems

Multispectral and SAR remote sensing data processing from air/space born sensors

Software tools

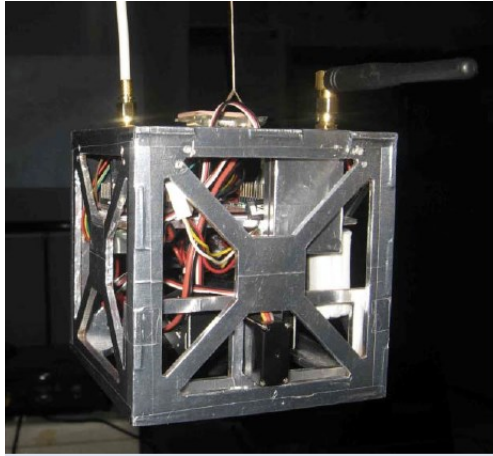
AI & BigData tools for satellite based ICT systems

Hosted UNISEC-Global Events

- 4th UNISEC – Global Meeting in 2016
- 7th Nano-satellite Symposium in 2016
- 4th Mission Idea Contest for Micro/Nano-Satellite Utilization in 2016
- 1st Deorbit Device Competition in 2016
- Hepta-Sat Training in 2017
- CanSat Training Competition in 2019



CubeSat and CanSat for Education

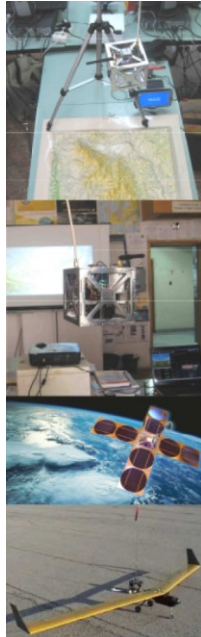


University Members

University members of UNISEC-Bulgaria:

- Sofia University
- National Military University
- Varna High School of Mathematics (associate)
- Technical University – Plovdiv
- Aerospace Technics and Technologies Lab at TU-Sofia (in process)
- Naval Academy – Varna (in process)
- Bourgas University (in process)

1st Aerospace Engineering Program in Bulgaria (2019)

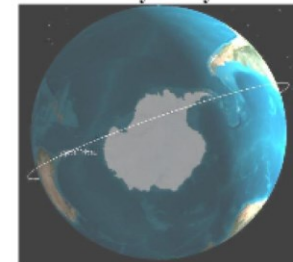


M.Sc. Program:

Aerospace Engineering and Communications (ASE&C)

Professional track: *Physics*
Educational level: *Master of Science*
Specialty: *Engineering Physics*
Training duration: *3 semesters*
Form of training: *Regular form*
Professional Qualification: *Master in Engineering Physics – Aerospace Engineering and Communications*

Sofia University "St. Kliment Ohridski"
Faculty of Physics



Joint initiative between Faculty of Physics at Sofia University and CASTRA

More Aerospace Engineering MSc Programs in Bulgaria



Naval Academy (2024)



Air Force Academy
(2024)



Technical University -
Sofia (2024)

Start-ups

Three start-ups initiated by UNISEC- Bulgaria former students



R&D Initiative for
building a
Spacecraft



Gives planetary-scale
awareness for each
organization based on Earth
Observation Data

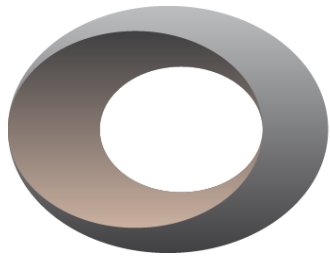
“Space Vision” Ltd.

R&D in aerospace
engineering and new
technologies

More to come...

UNISEC-Global Activities in 2023-24

- *Participation in Virtual UNISEC-Global Meeting*
- *Internship Programs led by companies*
- *Organizing Training*
- *On-going Practical Space Projects*



SEE

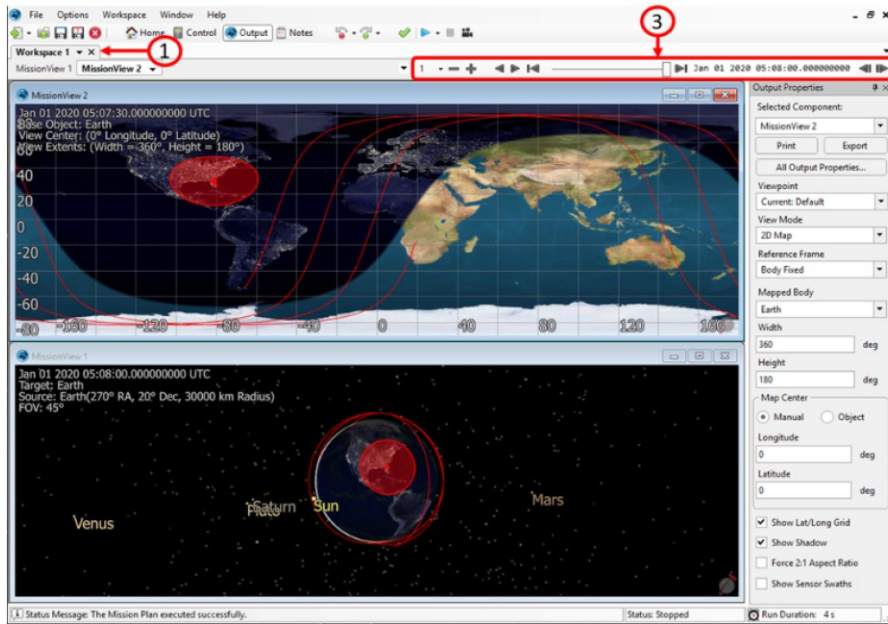
Simulation Exploration Experience

- *Annual Space Simulations initiative for Universities coordinated by NASA experts*
- *Locally supported by CASTRA/UNISEC-Bulgaria*



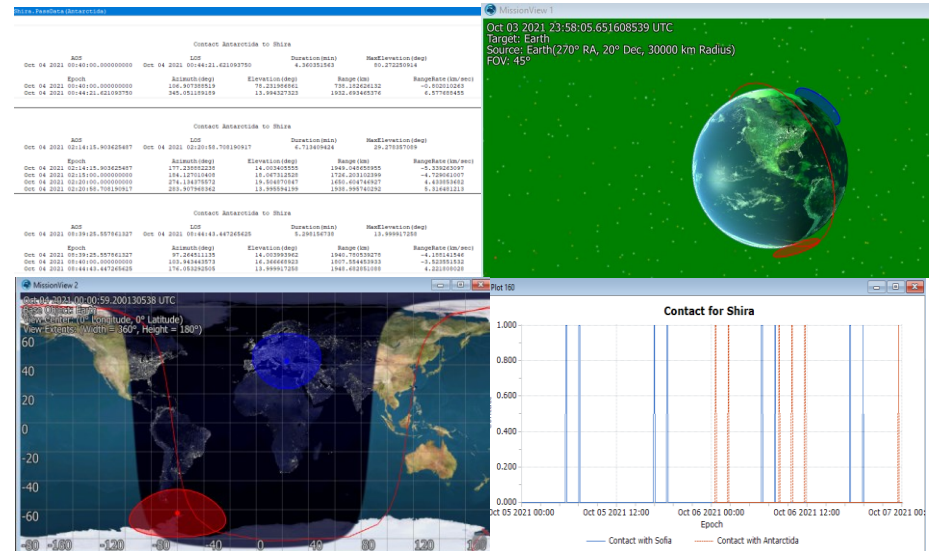
<https://simulationexplorationexperience.org>

FreeFlyer® Training



The FreeFlyer Output Screen

FreeFlyer® Training for Lecturers



Designing Mission Plans
and Satellite
Communications students
work by using FreeFlyer®

Plan for 2024-25 and beyond

- *Attracting more universities as active members*
- *Supporting the evolution of the Bulgarian National Space Program*
- *Supporting the growth of Aerospace Engineering University Programs*
- *Inspiring students for scientific work*
- *Involving students in practical aerospace projects*
- *Attracting funding from companies*

Contacts



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