

UNISON ITALY



Presenter: Alice Pellegrino



SAPIENZA
UNIVERSITÀ DI ROMA



4th UNISEC Global Meeting – Student Presentation
Kamchia (Bulgary), 23rd of October 2016



UNISEC and UNISON Italy

UNISEC and UNISON Italy were established by Sapienza – University of Rome and Alma Mater Studiorum, University of Bologna during the 3rd UNISEC-Global meeting in Tokyo (July 2015)

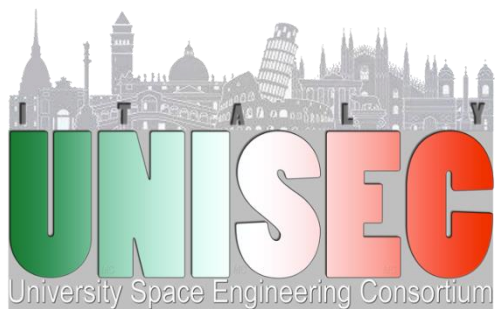


ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA



SAPIENZA
UNIVERSITÀ DI ROMA

UNISON Italy



ALMA MATER STUDIORUM
UNIVERSITA DI BOLOGNA



Universities Representatives

- **Rome:** Prof. Santoni
- **Bologna:** Prof. Tortora
- **Turin:** Prof. Corpino

Student Representatives

- **Rome:** Alice Pellegrino
- **Bologna:** Marcello Valdatta
- **Turin:** Luigi Mascolo



UNISON Italy Official Website

<http://unisonitaly.eu>



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UNISON ITALY

VERSIONE ITALIANA

ENGLISH VERSION



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Aerospaziale/difesa
in Italia (Italia)



Main organised events and participations

- **Participation in several conferences and events** related to the space field to present UNISEC/UNISON activities:
 - SpaceUP Rome, the 1st Italian «Unconference»
 - SGAC European Student Workshop (Padua)
 - 4th UNISEC Global Meeting at Kamchia (Bulgaria) – October 2016
 - Organisation of events related to the space field to present UNISEC/UNISON activities:
 - 2nd Annual Space Debris Student Opportunities Workshop (Sapienza – University of Rome)
 - Workshop about «The REXUS/BEXUS Programme: hands-on opportunity for Aerospace Students» (Sapienza – University of Rome)
 - SpaceUP Milan, the 2nd Italian «Unconference» – November 2016
 - 3rd Annual Space Debris Student Opportunities Workshop (Sapienza – University of Rome) – December 2016
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UNISON Working Groups



CubeSat Team

REXUS/BEXUS Team

CANSAT Team



REXUS/BEXUS Team



CubeSat Team

Rocket Team

Interplanetary
Mission Design Team



UNISON Italy – Turin



1. CubeSats

- Design and manufacturing
- Structural tests validation
- cooperation with the PoliTo's CubeSat student team

2. Analysis and design of space launchers

- Aerothermodynamics and structural design and characterisation of the ascent phase;
- Guidance and control;
- Solid Rocket Boosters grain characterisation and validation;
- Re-entry and recovery systems.

3. Analysis and design of various phases of an interplanetary mission

- Possible joint-work with the rocket team for the ascent and de-orbiting phases;
- Structural design of the spacecraft;
- Orbits and trajectories characterisation and optimisation: use of the GMAT, ASTOS and MATLAB softwares;
- Space propulsion: Liquid Rocket Engines or low-thrust continuous propellers;
- Astronauts life support: human factors and re-entry modules.

UNISON Italy – Bologna

- **REXUS/BEXUS Team**
 - Participation in the BEXUS cycle 09 in collaboration with Sapienza – University of Rome with “STRATONAV (STRATOspheric NAVigation) Experiment”



ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA





UNISON Italy – Rome

1. CubeSats

- Design, manufacturing, testing and management of the main project phases.

2. REXUS/BEXUS Team

- Participation in the BEXUS cycle 09 in collaboration with Alma Mater Studiorum – University of Bologna with “STRATONAV (STRATOspheric NAVigation) Experiment”.

3. CANSAT

- activity related to the CANSAT design and development will start during the second semester of the Bachelor’s Degree in Aerospace Engineering at La Sapienza, University of Rome, in the framework of the Space Systems Laboratory.

4. Additional students activities

- Participation at the **Space Apps Challenge 2016** with “Asteroid Express” project;
- Participation at the **4th Mission Idea Contest** with the designed “HORUS Cluster”;
- Participation at the **1st Deorbit Device Competition** with the designed SSDC (Sailing System for CubeSat Deorbiting).



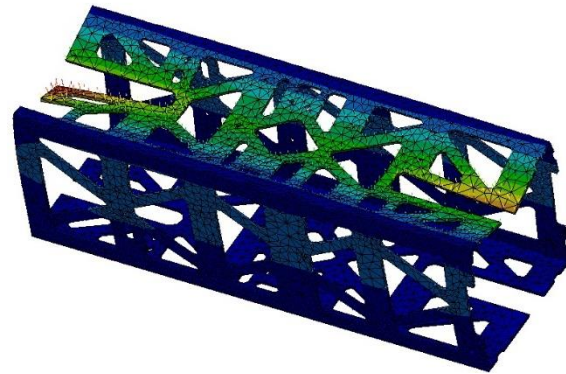
SAPIENZA
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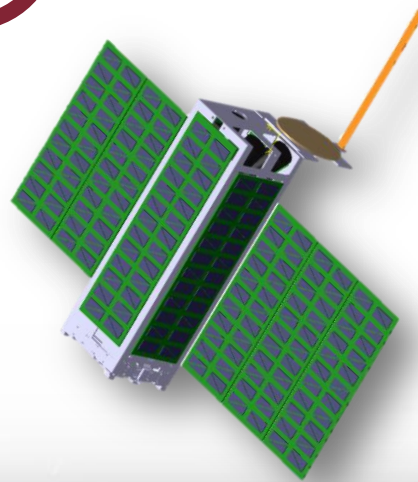
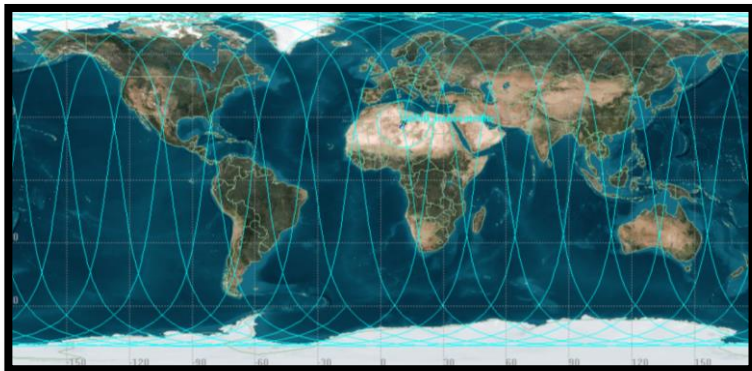
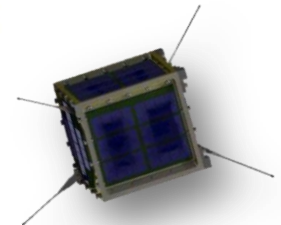
CubeSat Team

SPACECRAFT

- Design
- Testing
- Development
- Mission architecture



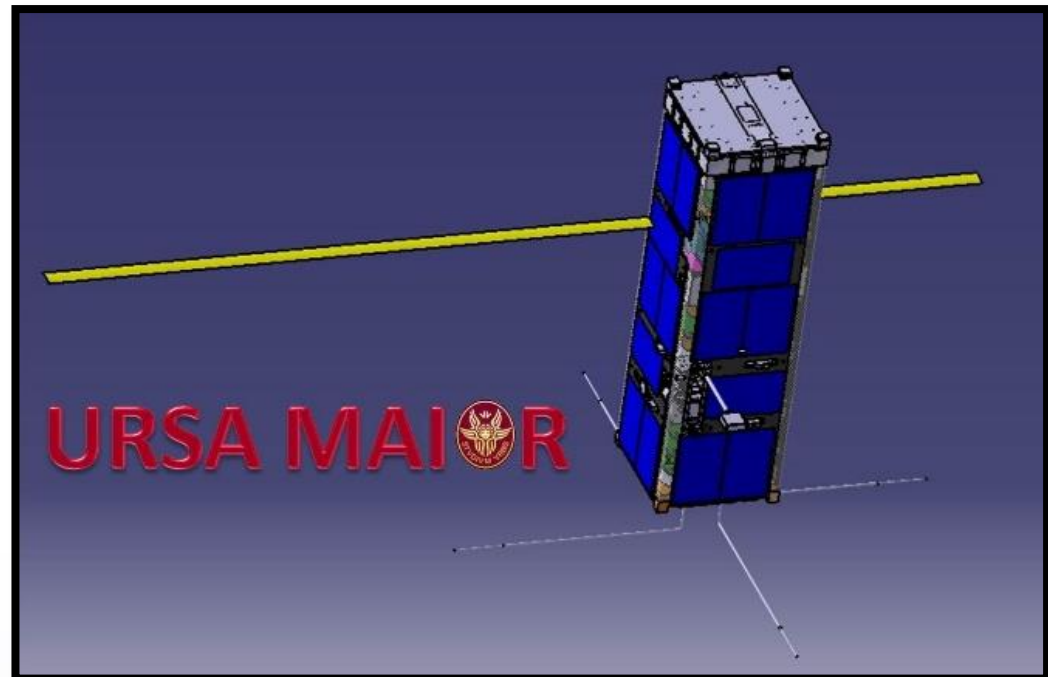
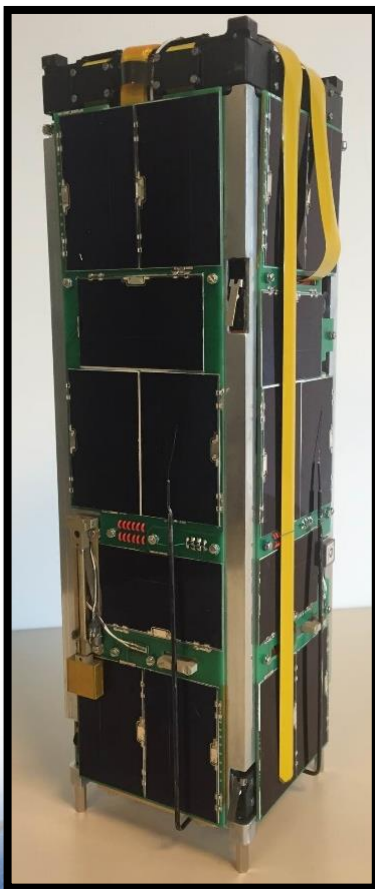
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CubeSat Team

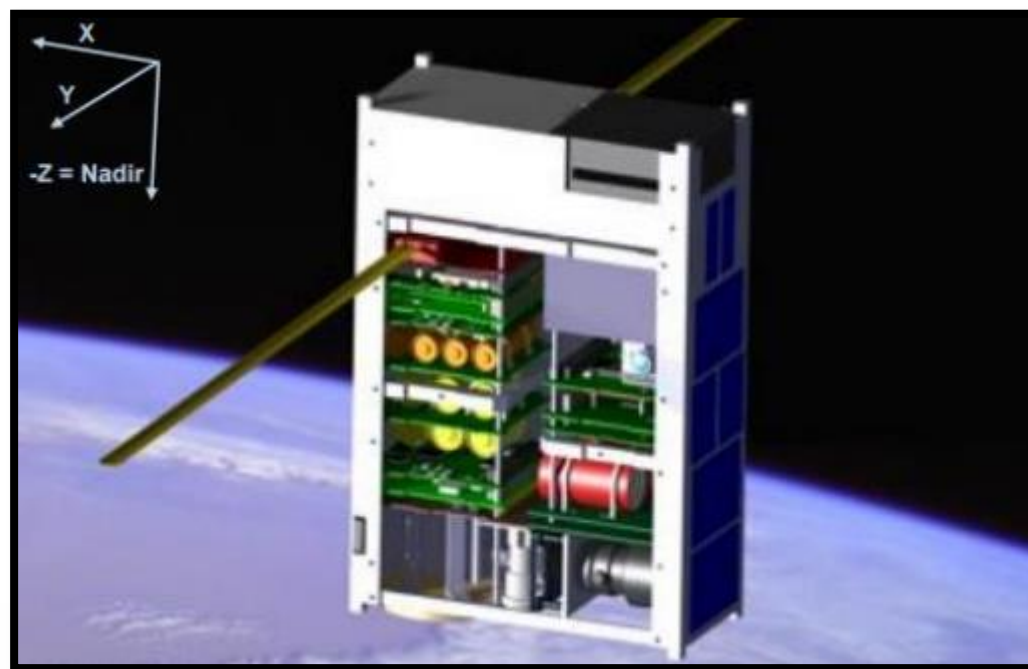
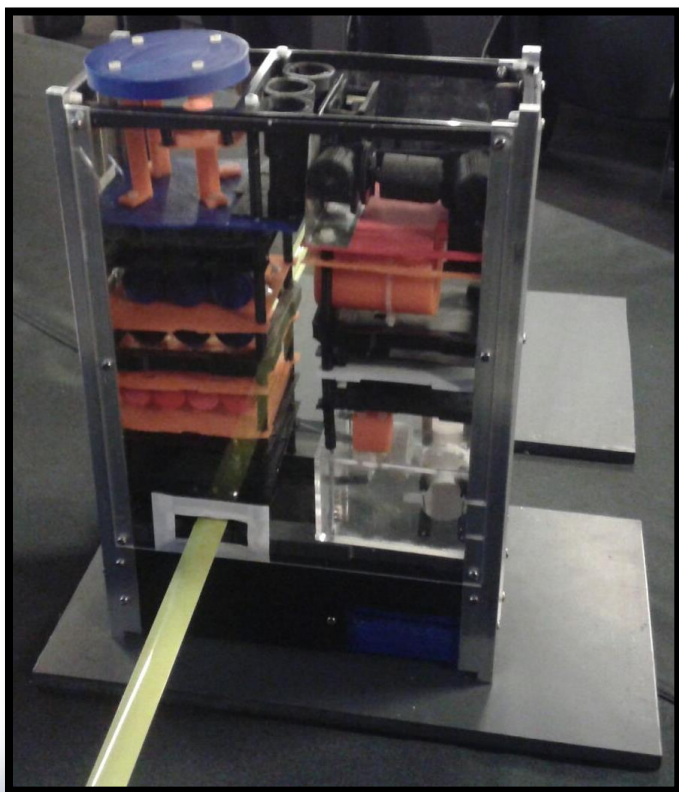
URSA MAIOR 3U CubeSat

University of Rome la Sapienza Micro Attitude In ORbit testing)



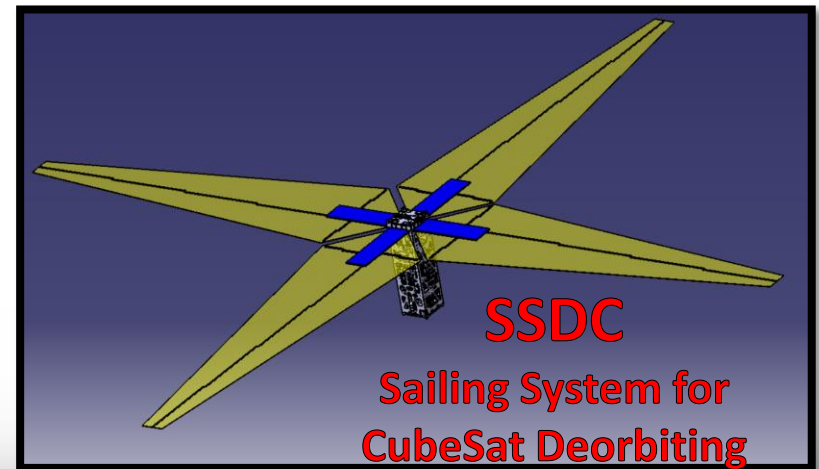
CubeSat Team

IKUNS 6U CubeSat (Italian-Kenyan University Nano-Satellite)



CubeSat Team

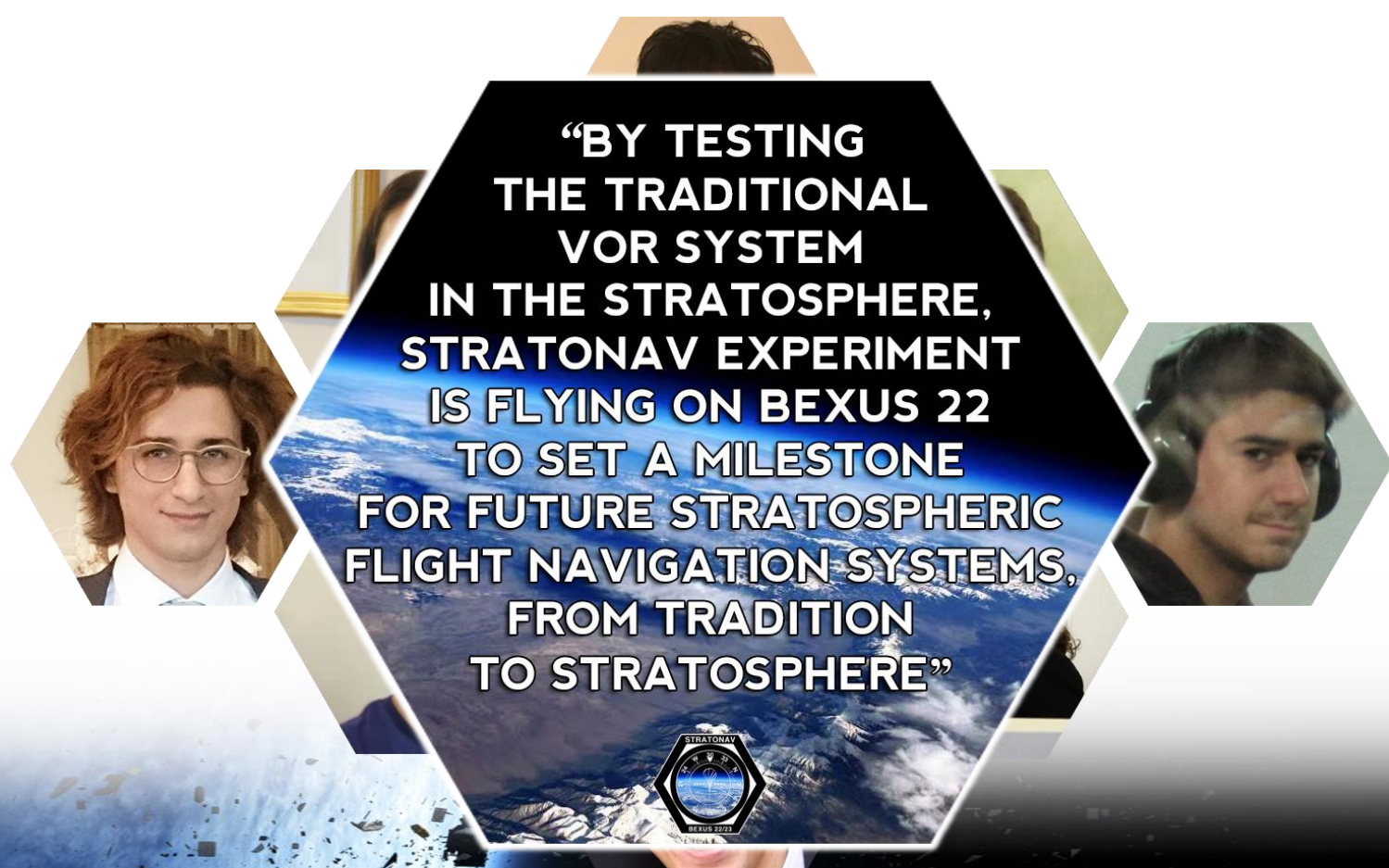
IKUNS 6U CubeSat (Italian-Kenyan University Nano-Satellite)





STRATONAV Team

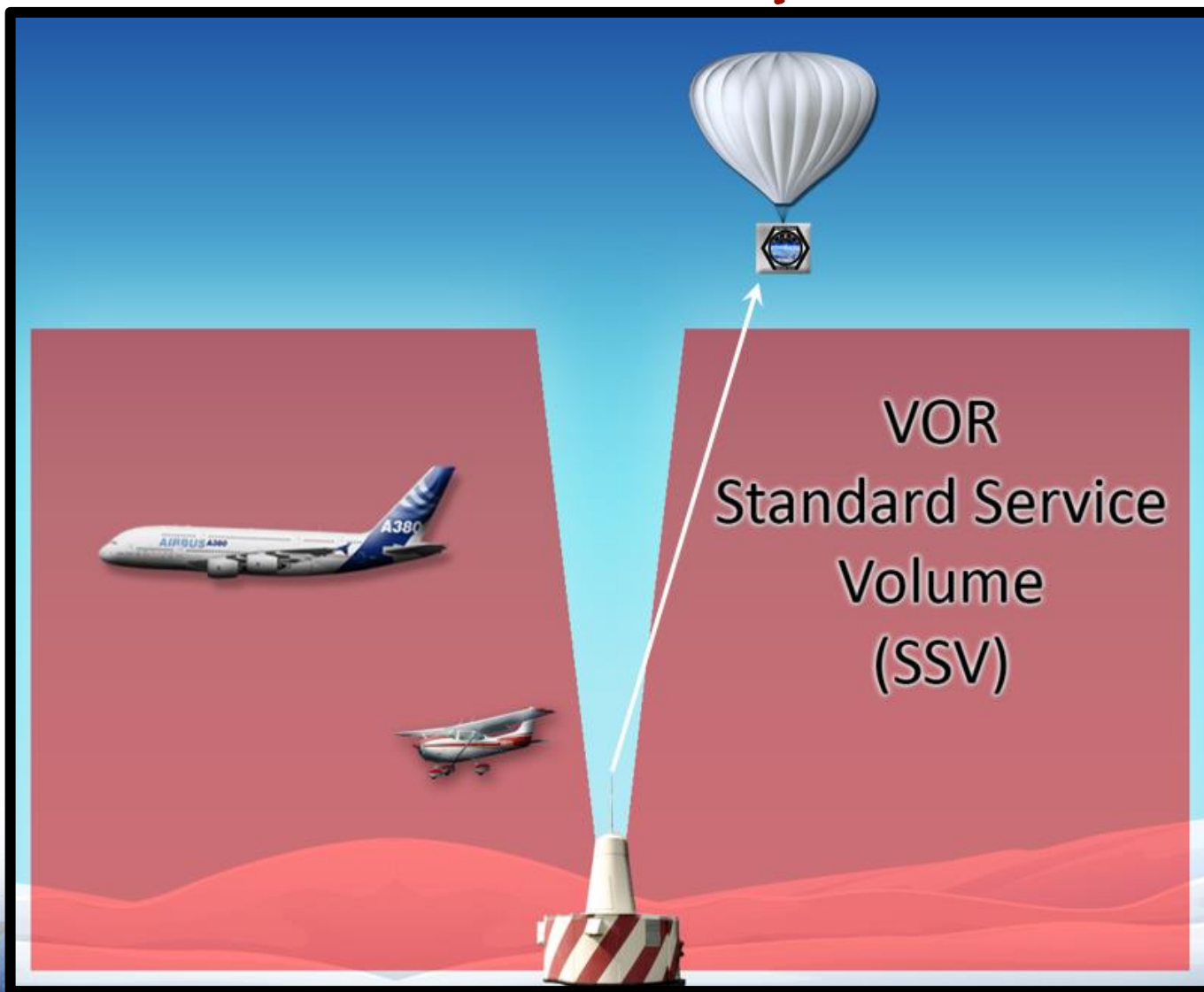
STRATONAV Experiment (STRATOspheric NAVigation)



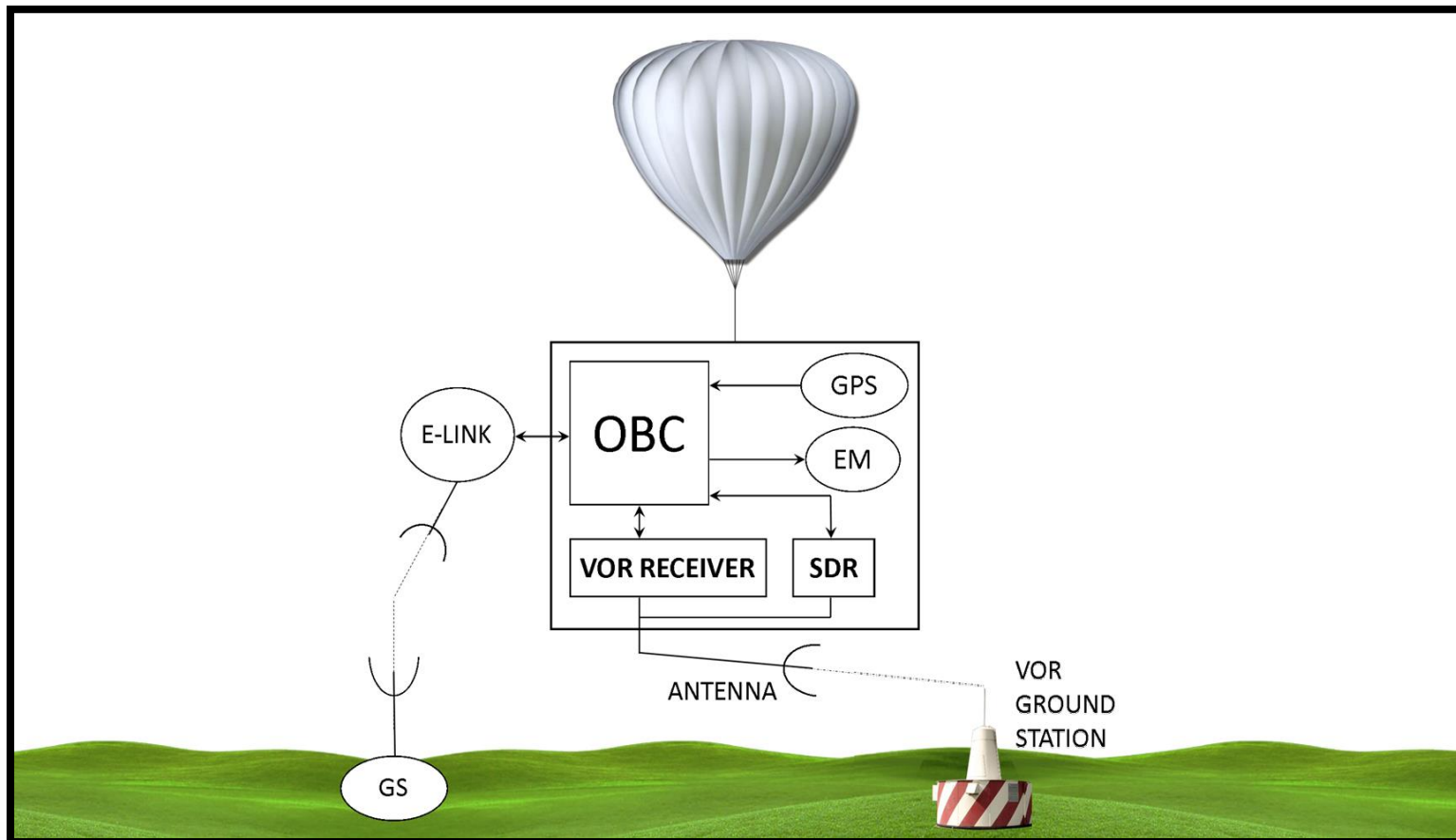
**“BY TESTING
THE TRADITIONAL
VOR SYSTEM
IN THE STRATOSPHERE,
STRATONAV EXPERIMENT
IS FLYING ON BEXUS 22
TO SET A MILESTONE
FOR FUTURE STRATOSPHERIC
FLIGHT NAVIGATION SYSTEMS,
FROM TRADITION
TO STRATOSPHERE”**



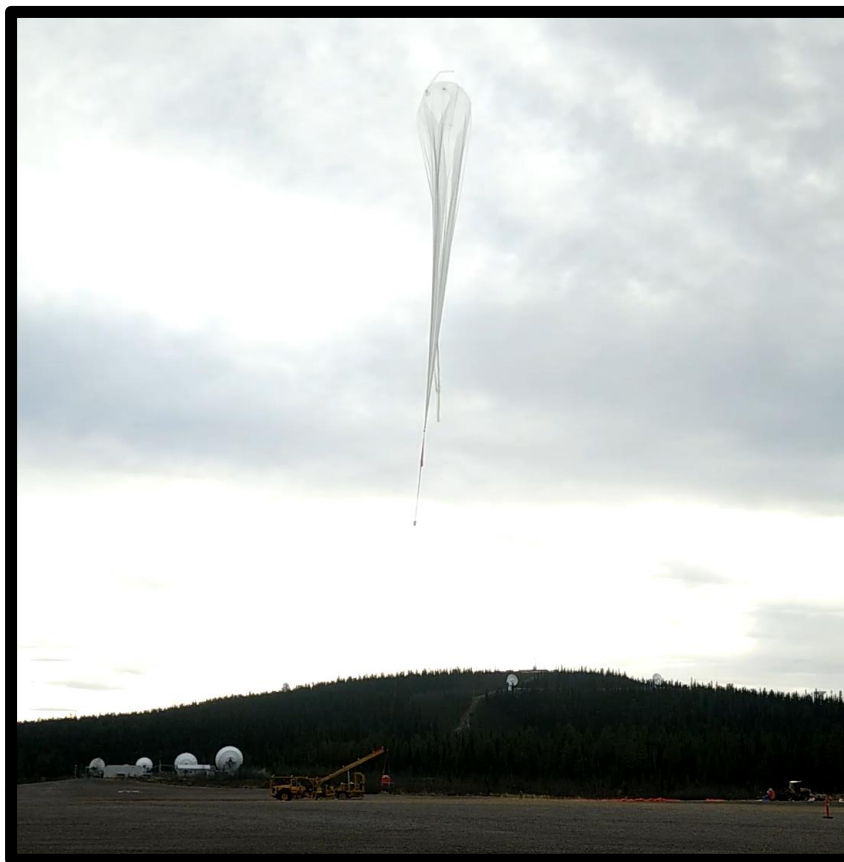
STRATONAV Experiment



STRATONAV Experiment



STRATONAV Experiment



OCTOBER 2016

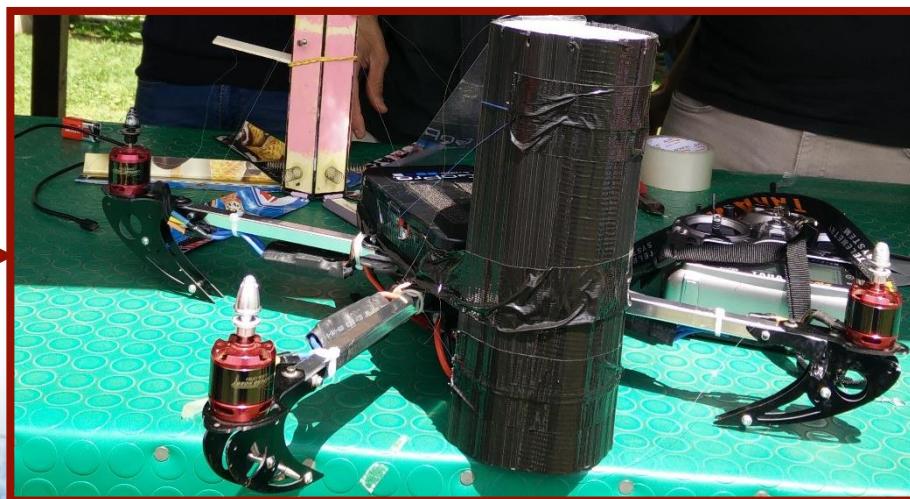
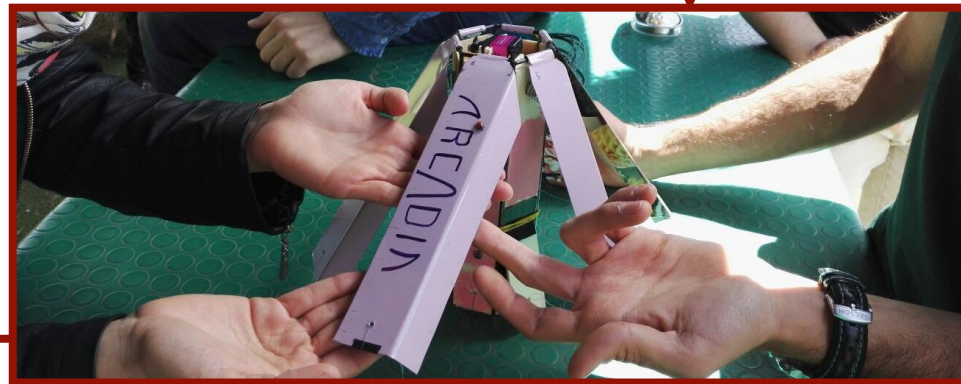


CANSAT Team

DESIGN

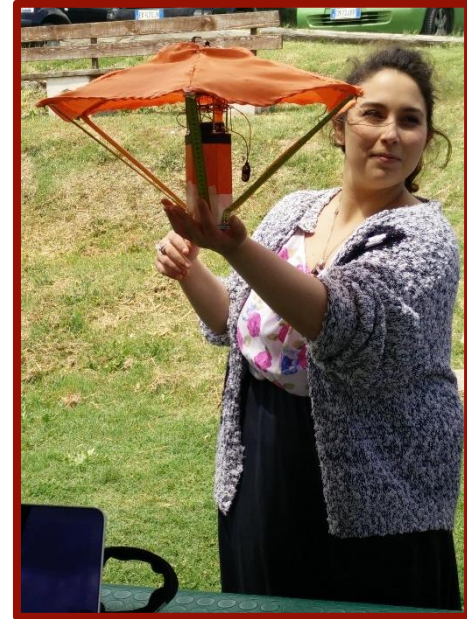


DEVELOPMENT



CANSAT Team

LAUNCH



CANSAT Team

LAUNCH



CANSAT Team

LAUNCH



S5lab Facilities



Low-Vacuum Chamber



Milling Machine



3D Helmholtz coil system



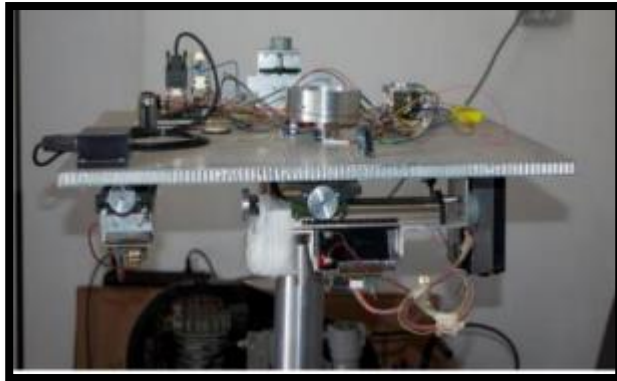
3 DoF ADCS test-bed



Satellite Ground Station



S5lab Facilities



Frictionless air bearing system



Electronics equipment



Sun Simulator Lamp



Remotely controlled space debris
Observatory



QUESTIONS?

Additional information:
ali.pellegrino.92@gmail.com

4th UNISEC Global Meeting
Kamchia (Bulgary), 20-23 October 2016

