

UNISEC-Bulgaria

SPACE RESEARCH ACTIVITIES IN BULGARIA

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CONTENTS

- HEPTA-Sat Inspiration
- International Summer Space School in Samara
- National Military University “Vasil Levski”
- Electrical Propulsion Systems
- Gamma-Ray Astronomy
- EnduroSat One – the first CubeSat in Bulgaria
- SAT-1 Initiative projects
- National Program for Space Research

HEPTA-Sat in Bulgaria

Back in October 2017 HEPTA-Sat training was conducted in Faculty of Physics at Sofia University.

During the training there were participants from:

Sofia University

National Military University

Bulgarian Academy of Sciences

Military Academy

Varna High School of Mathematics

SAT-1 Initiative

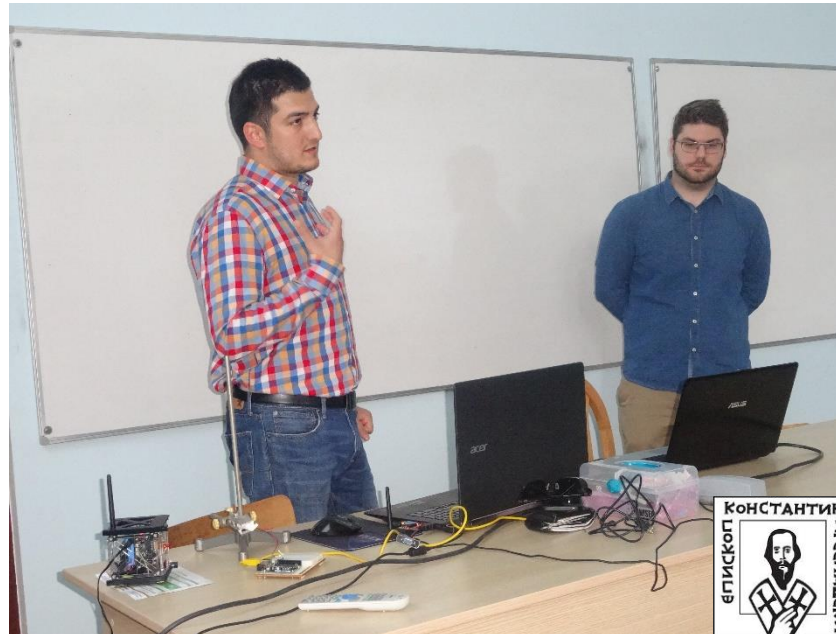


HEPTA-Sat Inspiration

With the practical knowledge and the HEPTA-Sat module, we gave public lecture in Shumen University on the Day of Cosmonautics April 12th 2018

The lecture was split in two parts:

- Lecture about the modern satellite technologies
- Demonstration of satellite subsystems and laser communication with the HEPTA-Sat module



HEPTA-Sat Inspiration

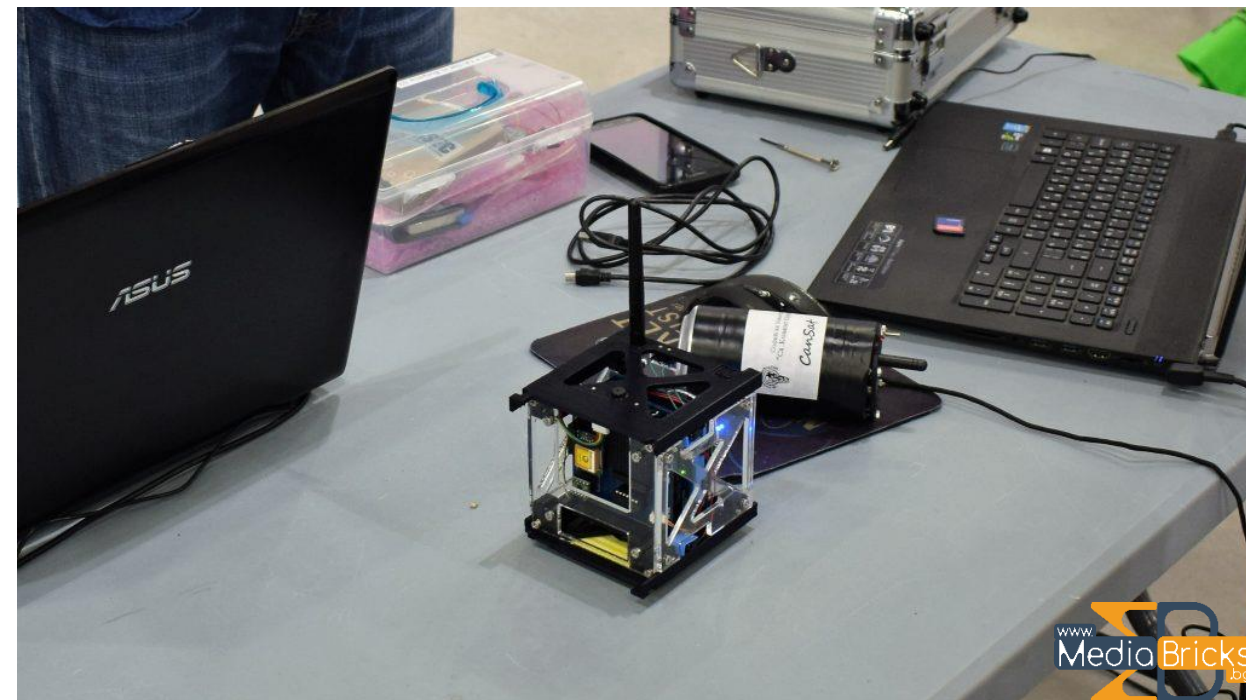
Open Day in Faculty of Physics on April 28th 2018

- We talked about the basic satellite systems
- The visitors were participating in the demonstrations with the HEPTA-Sat module
- The public was able to experience satellite technologies from first hand



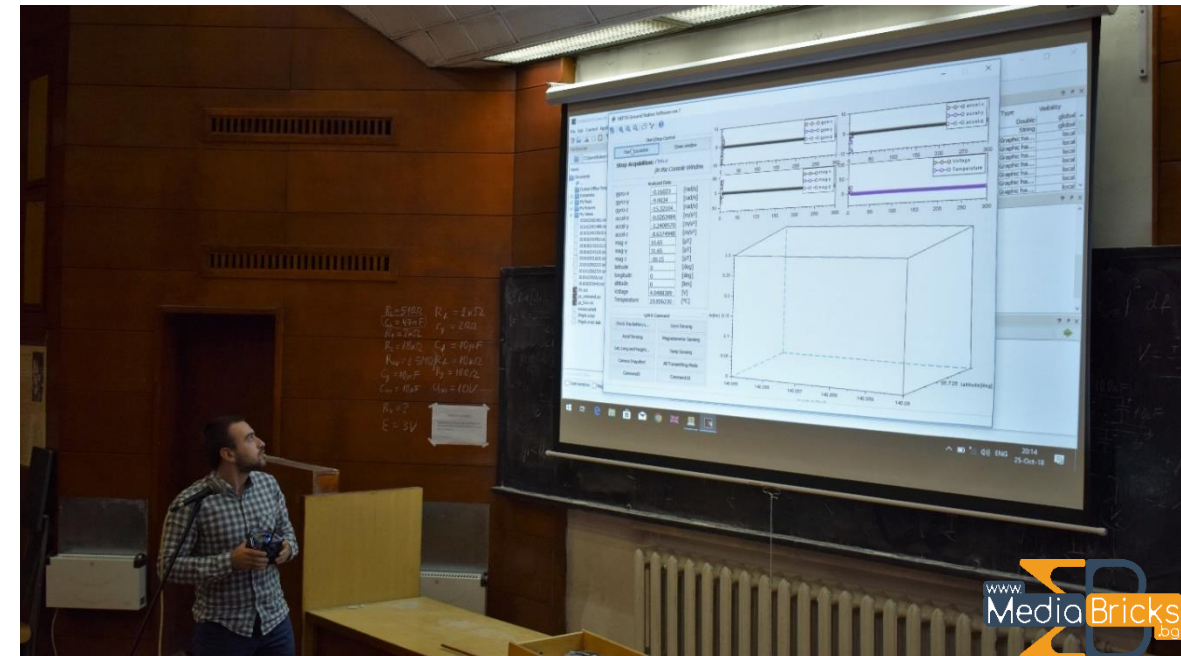
HEPTA-Sat Inspiration

- SAT-1 Initiative participated in the European Researchers' Night was on September 28th 2018
- The HEPTA-Sat module and training was presented to the public
- SAT-1 Initiative presented the ongoing projects of the organization



HEPTA-Sat Inspiration

- Public lecture as part of “Astronomy Workshop”, organized by department of Astronomy at Faculty of Physics. The lecture was attended by approx. 150 visitors
- Department of Astronomy further ignites the interest in the public in Space sciences with the MSc program “Astronomy and popularization of Astronomy”



HEPTA-Sat Inspiration

- Our goal is in 2019 to organize at least several HEPTA-Sat trainings in Bulgaria
- We plan to integrate a course based on HEPTA-Sat training in Aerospace engineering and communications MSc program at Sofia University
- In addition to the HEPTA-Sat training, we plan to develop a Payload Design course where participants will design their own missions and evaluate the requirements coming from the payload subsystem
- Further develop and expand the nano- and microsatellite propulsion systems course and activities

International Summer Space School in Samara

- The summer school took place in Samara from August 21st to September 1st 2018.
- The participants were from 14 countries, including 2 students from Bulgaria.



National Military University “Vasil Levski”

The students are learning how to design and 3D print various components of CubeSat structure

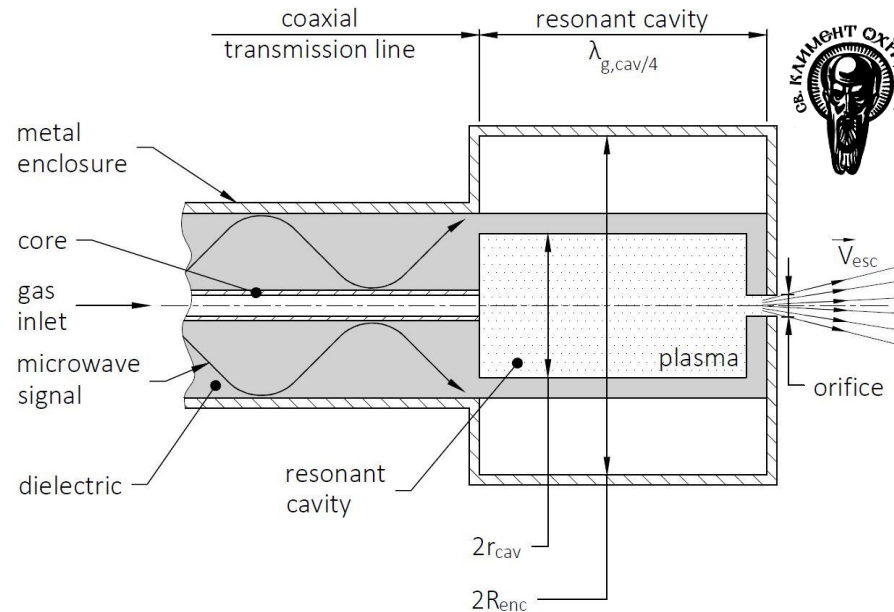


The National Military University is organizing a competition between its faculties. During the competition, the participants have to solve various applied physics and practical electronics problems.

Electrical Propulsion Systems

Department of Radiophysics and Electronics (Sofia University) works on the development of electrothermal microwave plasma thruster for nanosatellites. This novel approach can meet the power and size limitation imposed by the nanosatellite platform, including the CubeSat standard.

- There is years of experience in the department with surface wave discharges.
- The thruster is based on existing plasma source technology in the department
- Currently the research is in the process of financing and constructing the experimental set-up for obtaining first experimental results.



Conceptual scheme of electrothermal microwave plasma thruster.

contact: Assoc. Prof. Zhivko Kiss'ovski,
kissov@phys.uni-sofia.bg



Existing surface wave plasma source investigated in Faculty of Physics, Sofia University "St. Kliment Ohridski", Sofia, Bulgaria. Financially supported by Ministry of Education and Science, National Science Fund of Bulgaria project N2516

Gamma-Ray Astronomy

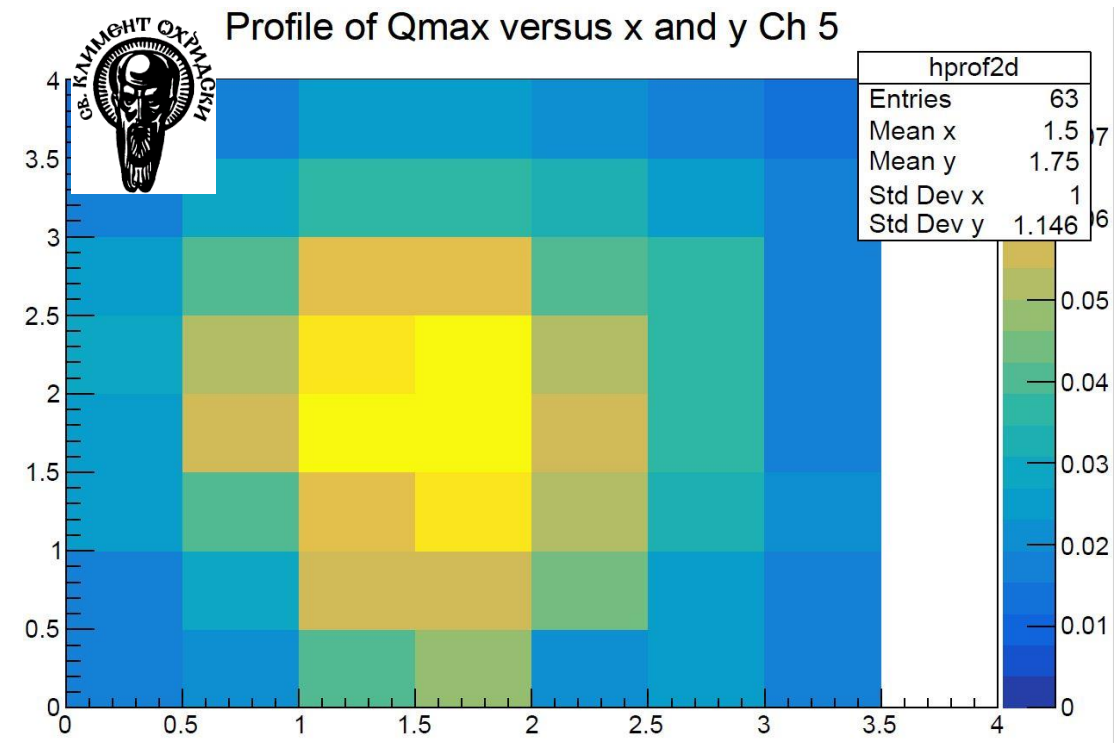
NDeGRA (Novel Detectors for Gamma-Ray Astronomy) is a project for R&D of a compact fast position sensitive gamma-ray detector that can be used in gamma-telescopes 'focal plane'. Joint project between departments of Atomic physics, Astronomy and Nuclear engineering at Faculty of Physics, Sofia University.

The space-borne gamma-telescopes use the interactions of gamma rays with matter. They are based mainly on two technologies:

- gamma camera;
- coded aperture mask.

Both methods rely on massive chunks of scintillation detectors to absorb the full energy of the incident radiation.

Up until now, gamma-telescopes have been integrated in medium-size missions. Based on team's previous experience, the goal is to squeeze the detector in order to fit inside a nano-satellite. And this is what NDeGRA is all about.

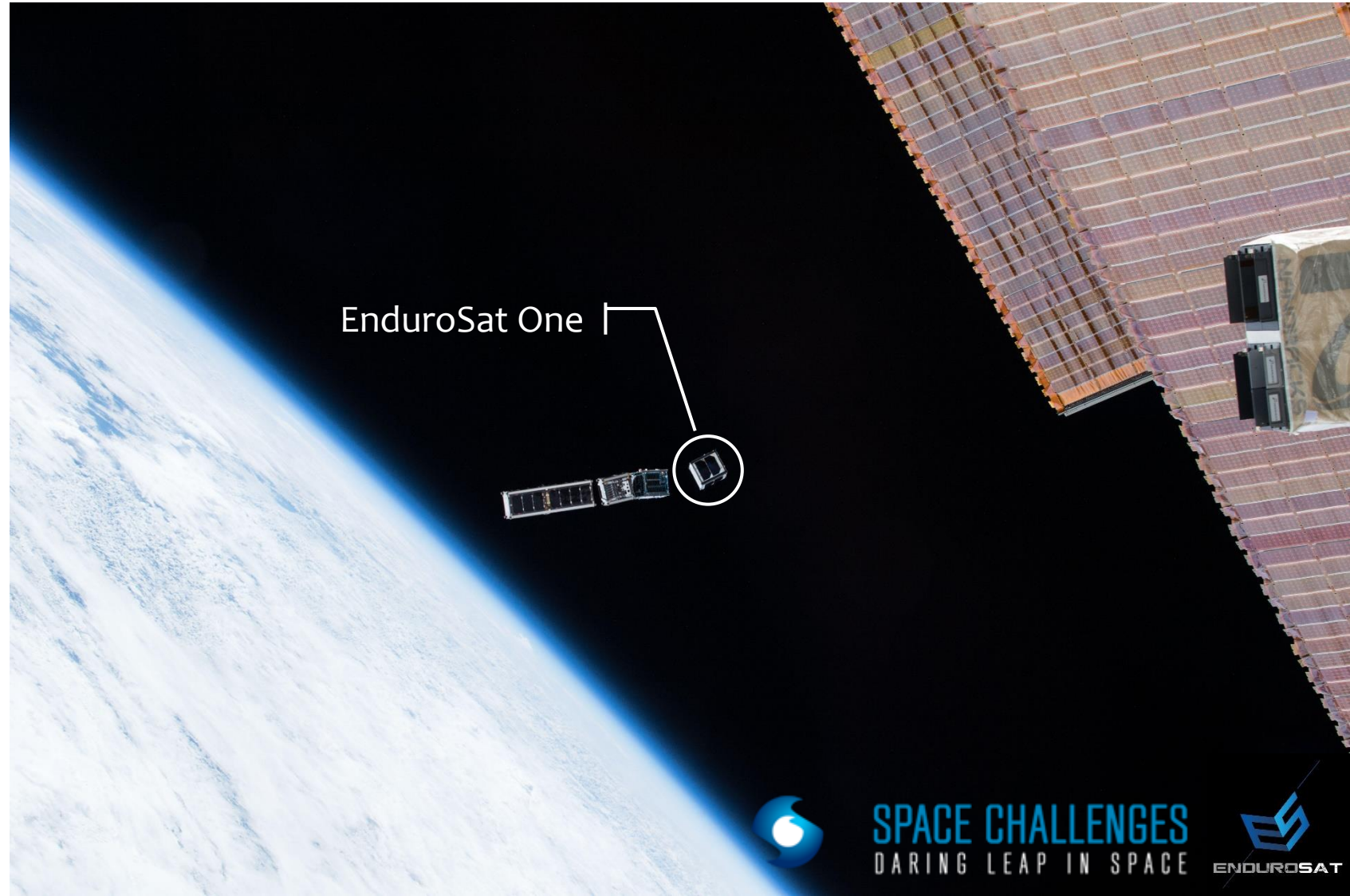


2D scan of position-sensitive detector with electron beam
National Science Fund of Bulgaria Contract *ΔH18/17*
contact: Assoc. Prof. Stefan Lalkovski, s.lalkovski@phys.uni-sofia.bg

EnduroSat One – the first CubeSat in Bulgaria

- The fourth Bulgarian satellite, but the first CubeSat mission
- On May 21st 2018 EnduroSat One is launched with ISS resupply mission OA-9
- On July 13th 2018 EnduroSat One was deployed from the ISS
- The satellite was developed by Space Challenges and EnduroSat
- Space Challenges created the largest free space knowledge platform in Europe

www.spaceport.academy



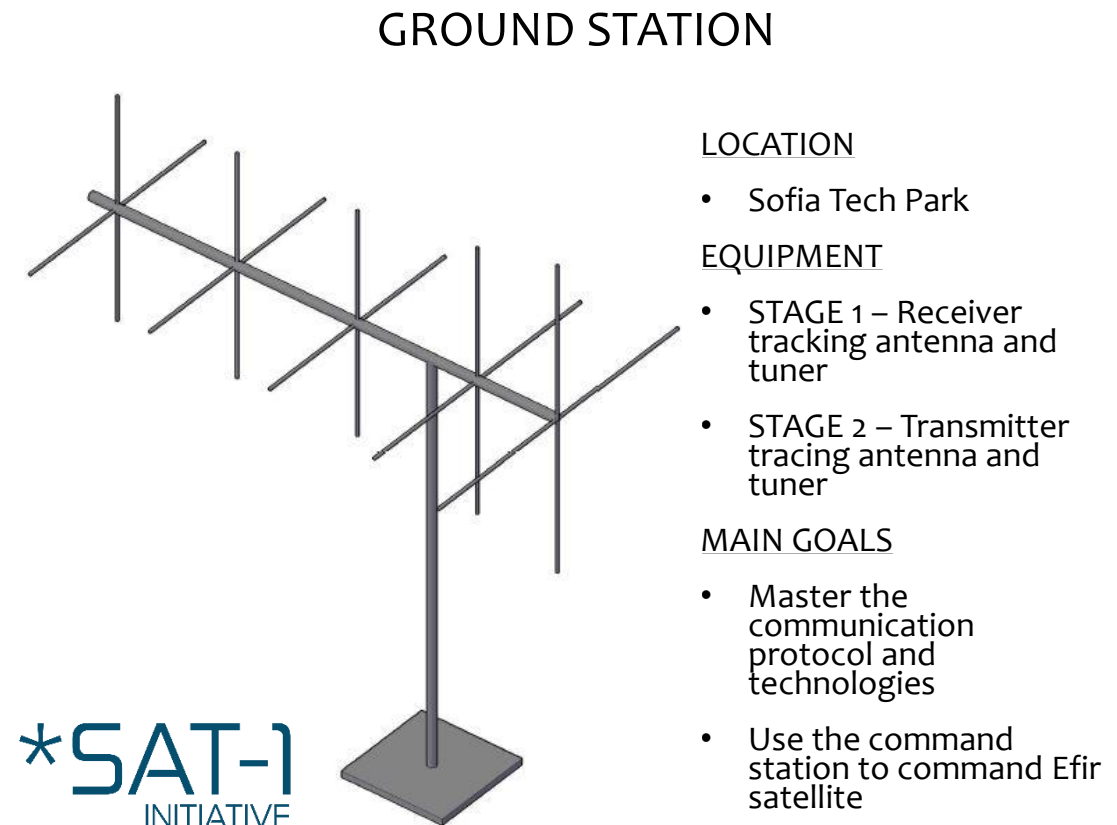
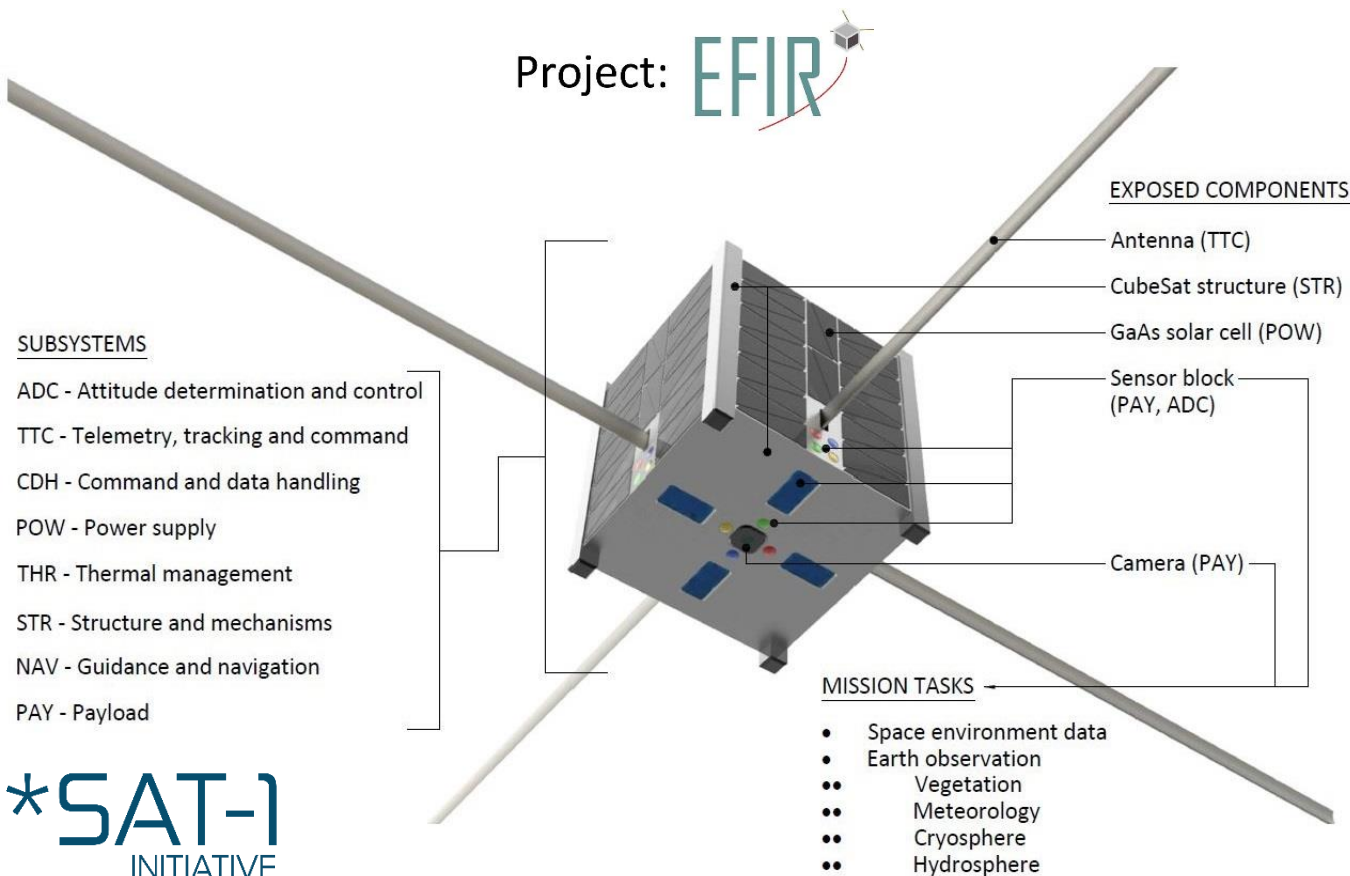
SPACE CHALLENGES
DARING LEAP IN SPACE



ENDUROSAT

SAT-1 Initiative

SAT-1 Initiative is non-profit NGO consisted of mainly students and young specialists with members stationed in Bulgaria, Sweden, Netherlands, Germany and Belgium.



National Program for Space Research

- There are a lot of new space related activities and projects in 2018
- This raised interest led to the idea of creating National Program for Space Research which could fund future endeavors
- The program is currently being created by university and educational institution experts and it is expected to be submitted to the government by the end of 2018

THANK YOU FOR YOUR ATTENTION!

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