

Polish Students Space Activities



Scarab – Mars Rover



Education projects



Education Projects – kind of an investment...



How we work

- Universities of Technology (Warsaw, Wroclaw, Gdańsk, Cracow)
- Especially Students' Space Association and Student Space Engineering Scientific Group from Warsaw University of Technology
- Participation in ESA Education Office programmes
- International Competitions
 - University Rover Challenge





Collaboration

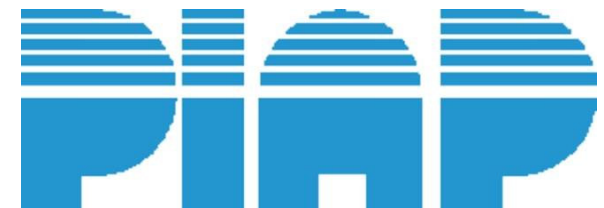
- European Space Agency
- Polish Astronautical Society
- Mars Society Poland





Collaboration

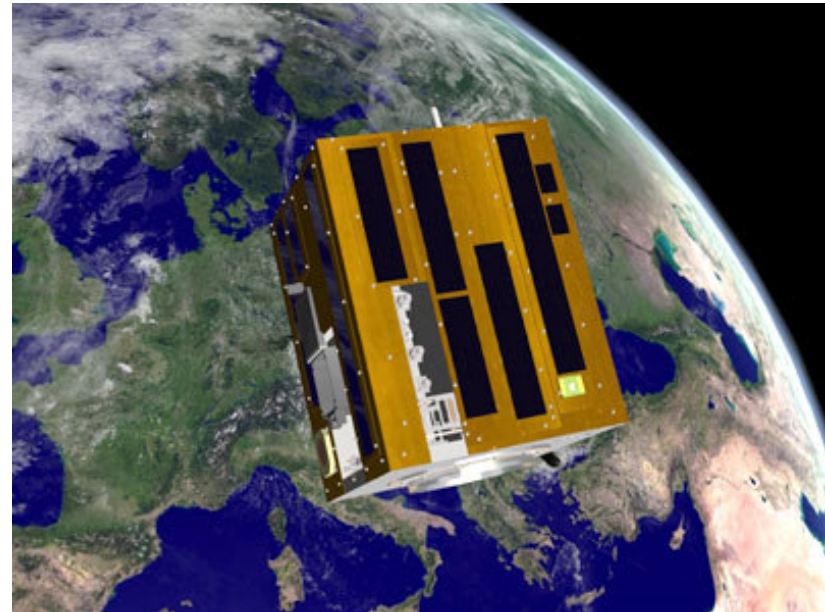
- Space Research Centre Polish Academy of Sciences
- Space Generation Advisory Council
- Industrial Research Institute for Automation and Measurements





SSETI Express

- **Goals:**
 - To take pictures of the Earth
 - Test the hardware and technology being developed for the ESEO
- **Polish teams:**
 - Operations (Warsaw)
 - Communication (Wroclaw)





Young Engineers' Sattelite 2

- Goals:
 - To test „Space Mail”
 - To change the orbit without rocket engines and attitude control system
- Poland contribution (Warsaw):
 - Thermal protection
 - Mechanical documentation
 - Structure





Parabolic flights

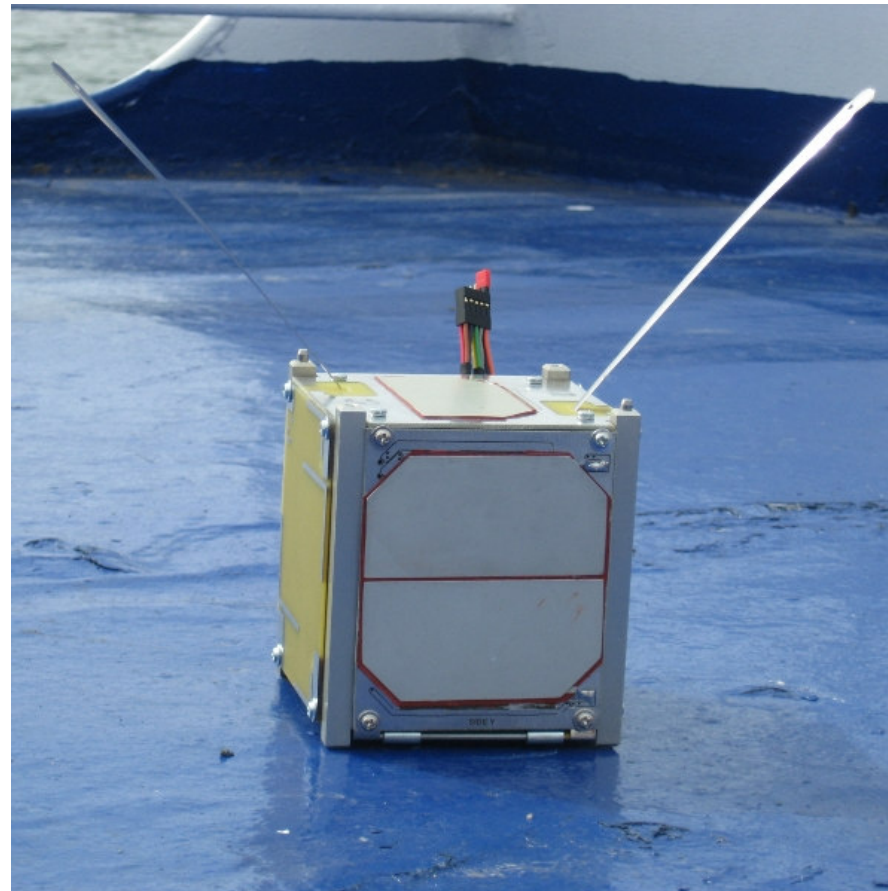
- Polish experiments:
 - self-ignition in ZERO-G
 - 3D visualization of magnetic field
 - research of capillary properties
 - combustion of dust
 - diffuse combustion





PW-SAT

- First polish cubesat
- Warsaw University of Technology





PW-SAT

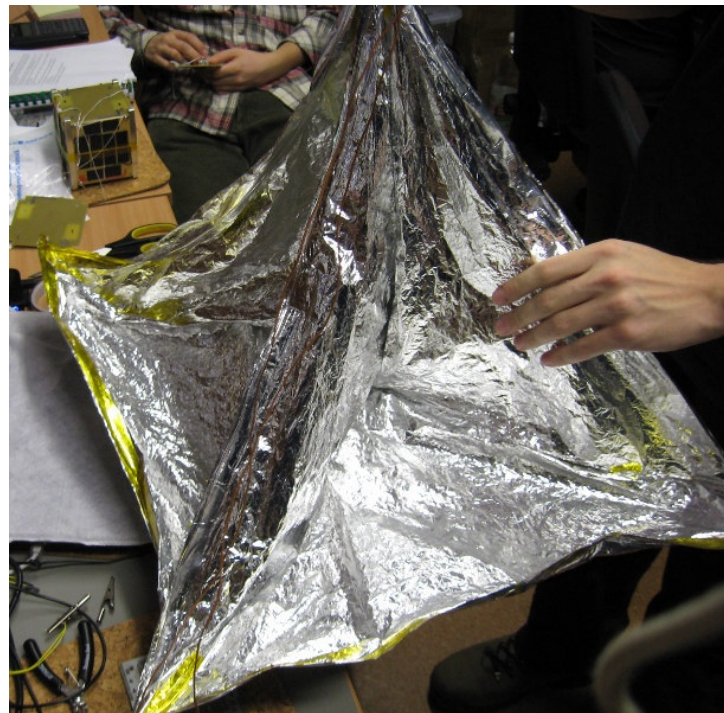
- Historical overview
- Designed and developed by students
- Build by Students' Space Association and Student Space Engineering Scientific Group





PW-SAT

- Goals:
 - test the new deorbitation system of space debris
 - test all systems designed by students





PW-SAT

- Facts:
 - launch in the end of the 2009
 - final phase of developing





Scarab

- Polish Mars Rover
- International Competition – University Rover Challenge



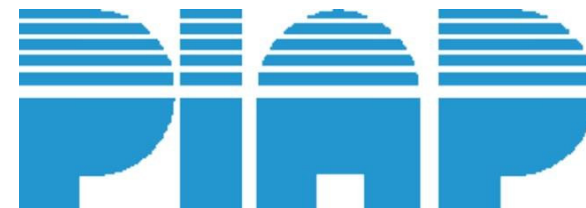


Scarab

- Build by Students' Space Association and Mars Society Poland



- Partners: Industrial Research Institute for Automation and Measurements, Ministry of Science and Higher Education





Scarab

- 4 competitions:
 - Geology task
 - Biology task
 - Emergency task
 - Construction task





Scarab

- This year's results: 6 place
- Only rover from whole Europe





GENSO

- Global Educational Network for Satellite Operations (GENSO)
- University of Adam Mickiewicz in Poznań





ESEO Mission

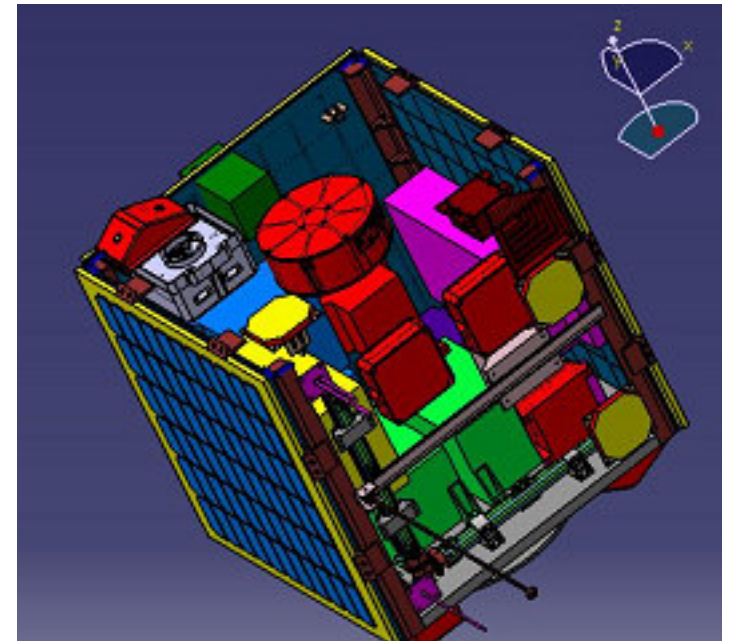
Mission Objectives:

- To take pictures of the Earth and/or other celestial bodies.
- To provide measurements the radiation enviroment in Earth orbit and its effects on the satellite components
- To test technologies for future education satellite missions



ESEO - OPER

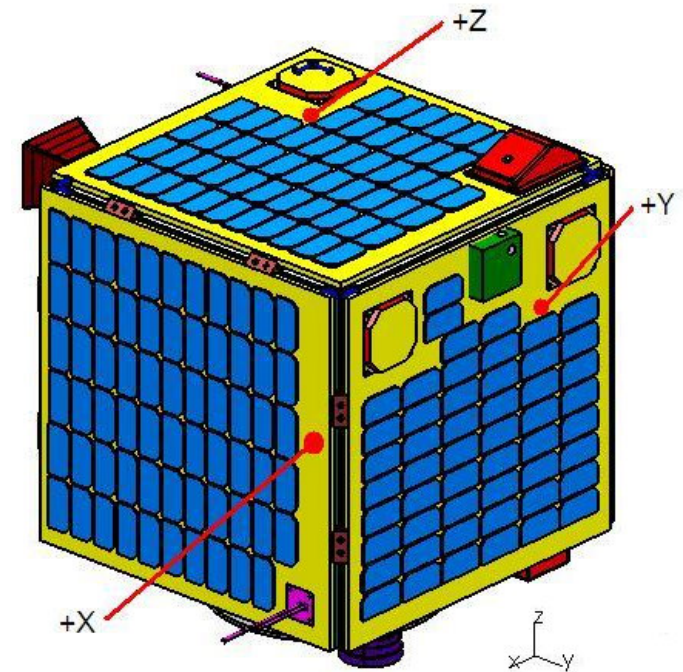
- Preparing the Mission Operations Plan
- Creating the system procedures
- Control over the satellite during the mission
- Mission planning on a daily basis





ESEO - OBDH

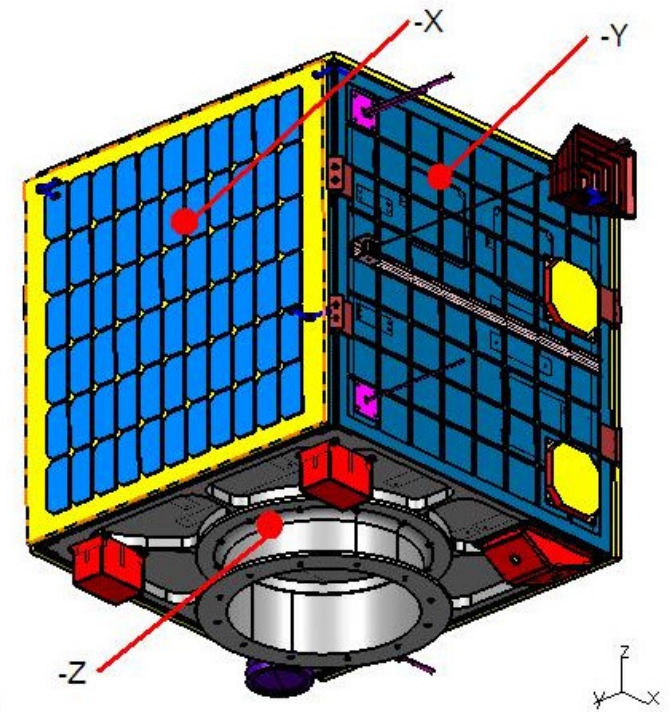
- Validate and execute telecommands received from the Ground Segment
- Control the system bus
- Collect housekeeping data
- Mission Time Maintenance
- Management of the various functional modes of the satellite
- Management the power





ESEO - COMM

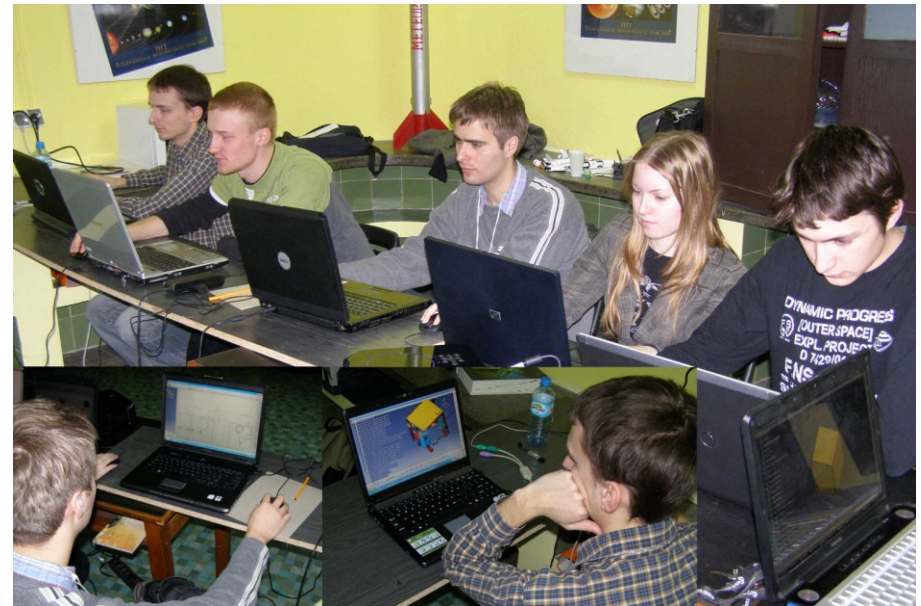
- Design of microwave devices
- CAN nodes - define the way to exchange information for devices
- Telecommand decoder and telemetry encoder
- Low Gain Antennas for operation in S-Band
- Optimisation of antenna placement





ESEO - CONF

- Mechanical configuration
 - Main and subsystems constrains
 - Subsystems preferences
 - Optimizing alocation of subsystems and conections between them
- Documentation
- Supporting in 3D modeling





Planetary Defence

- Defense from threat of possible impact
 - NEO
 - space debris





Planetary Defence

- Goals:
 - gathering data of small bodies of Solar System – self-education
 - design and research of new mitigation options
 - making people aware of the importance of planetary defense activities
 - integration of polish activities in planetary defense



Planetary Defence

- Contribution:
 - students' research
 - mitigation options
 - the idea of space-billard chain
 - solar sail
 - the idea of microrobots investigating the surface of NEOs
 - design of a reconnaissance mission to Apophis
 - analysis of possible polish activities in planetary defense
 - creating of a net of observatories in Poland



REXUS/BEXUS

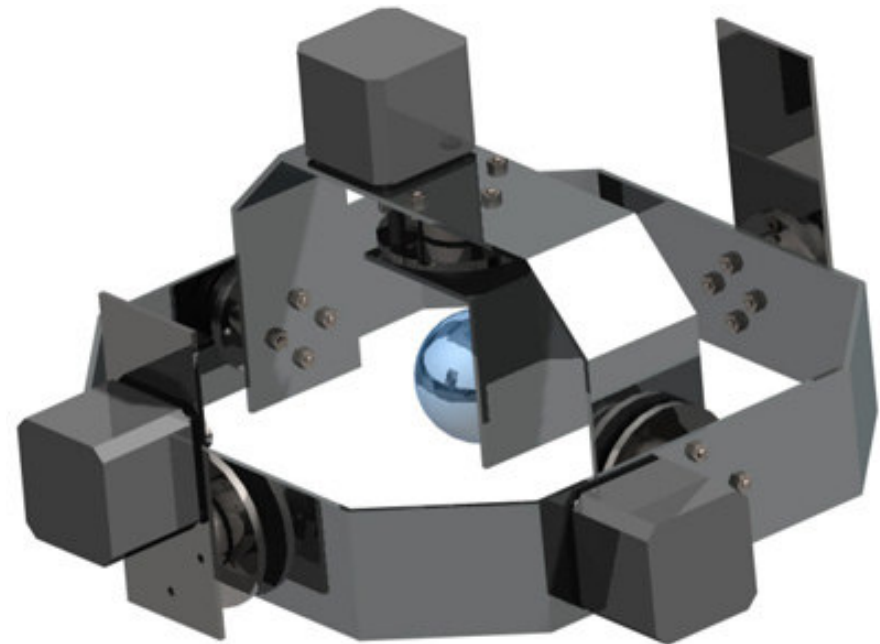
- REXUS/BEXUS Program
- Student Experiments on stratospheric balloons and sounding rockets
- Last Year: Icarus
- Participants: SKA, SKIK





REXUS/BEXUS

- This year's project - SCOPE
- Pointing mechanism
- Test on strathospheric balloon in Kiruna (Northern Sweden)





Education Projects

... like investement, that will bear fruits in future
– many space engineers in Poland

