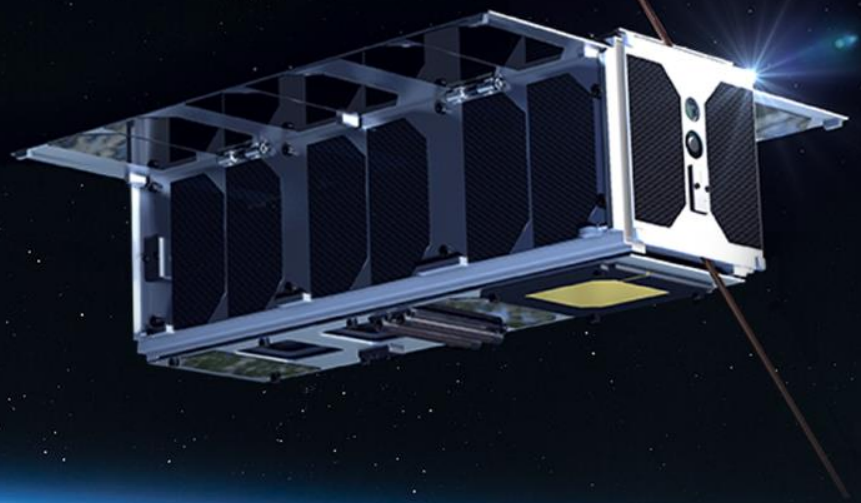
# ESTCube-2 Satellite and Missions

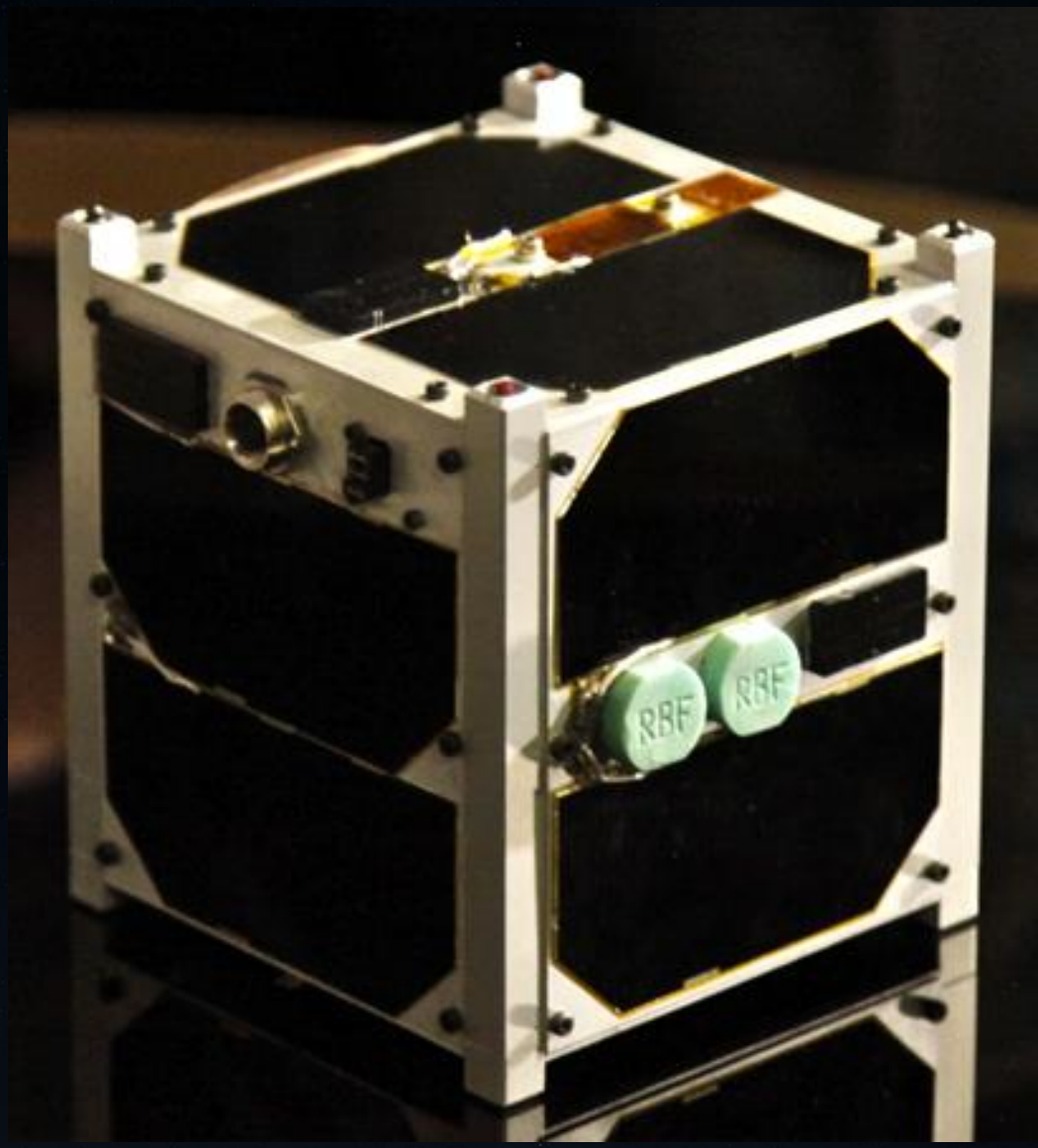


Hendrik Ehrpais

ESTCube CTO

# The Heritage

- 2 Year lifetime
  2013 – 2015
- 10 m E-Sail tether
  deployment test



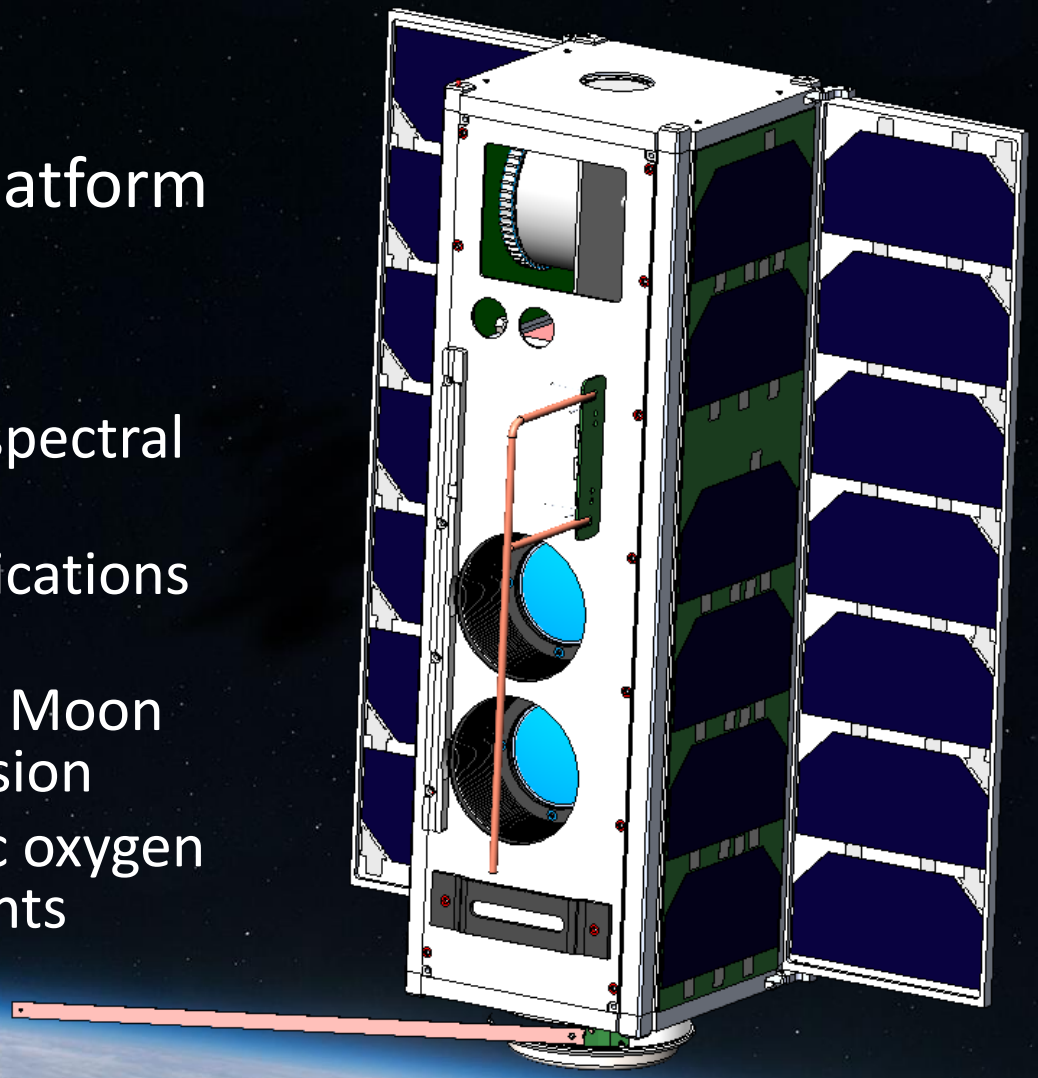

ESTCUBE

# The Lessons

- In-Orbit calibration and comissioning
  - Software Updates
- Ferromagnetic materials
- Payload testing
- All the other technical lessons:
  - Prototypes, model philosophy, testing and testing to learn, redundancy, infant mortality, I2C -> SPI, Payload feedback, COTS is good, and many others
- Student missions don’t have to be simple!

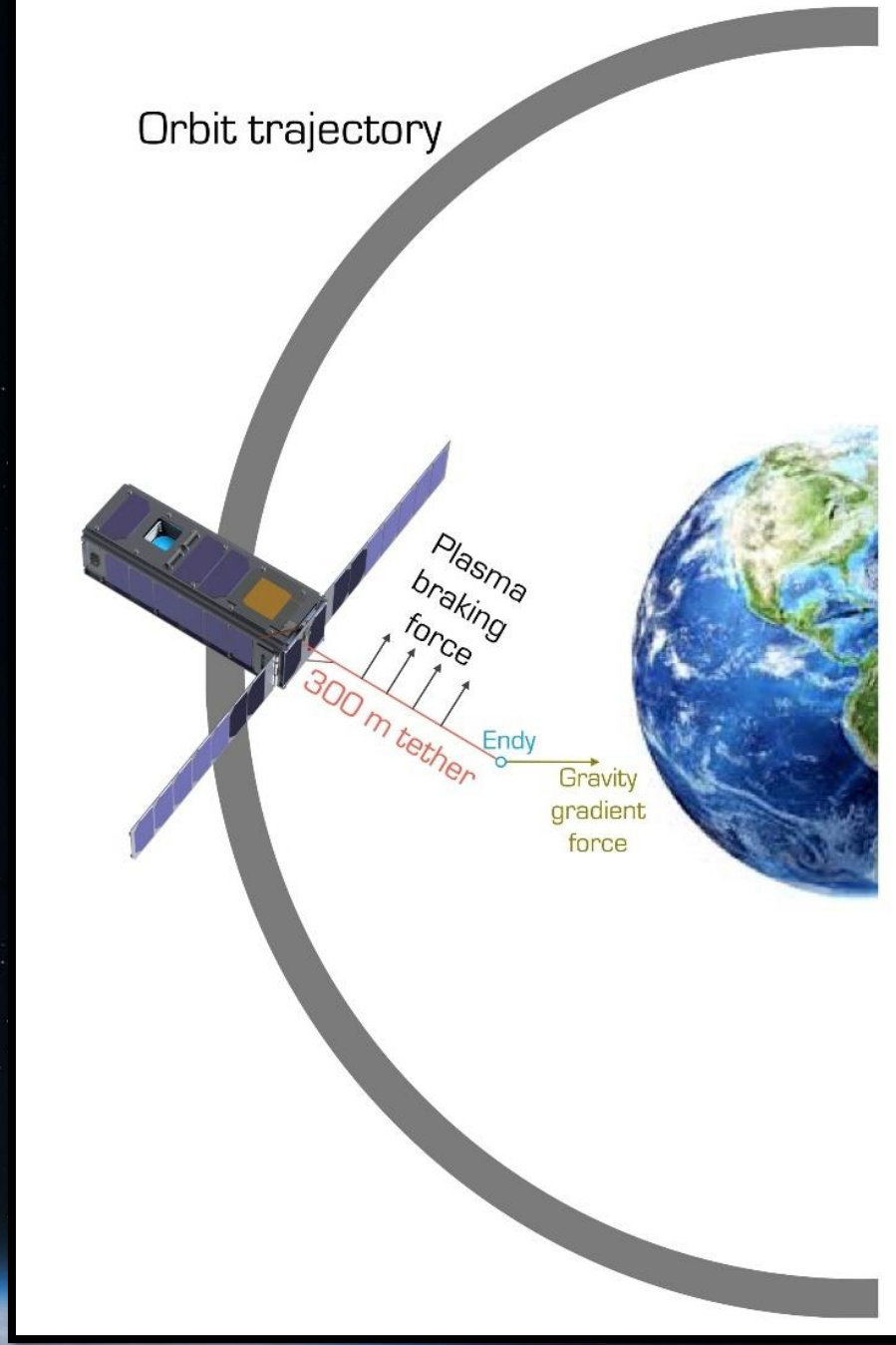
# The Satellite

- 3-U CubeSat
- Integrated satellite platform
- Missions:
  - Plasma brake
  - 2 Earth observation spectral imagers
  - High speed communications system
  - Satellite platform for Moon with Cold gas propulsion
  - Radiation and atomic oxygen protection experiments

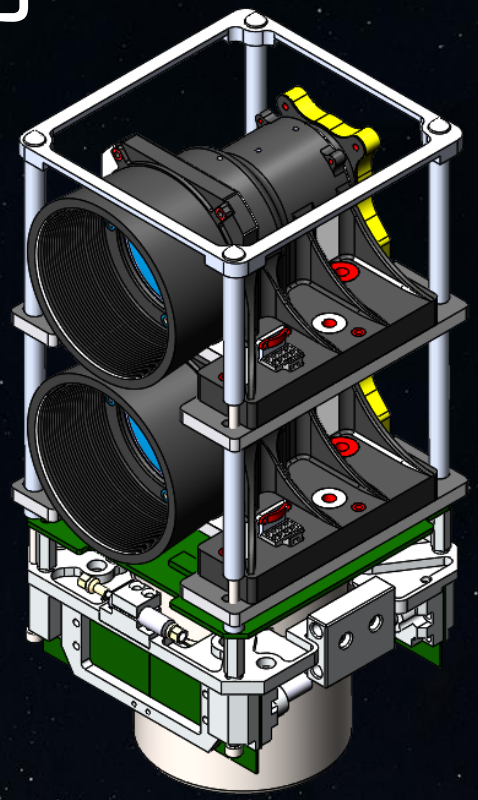


# Plasma brake

- Finnish Meteorological Institute
- 300 m long tether
- 1 kV charge
- 4kg CubeSat from 700 to 500 km altitude in half a year



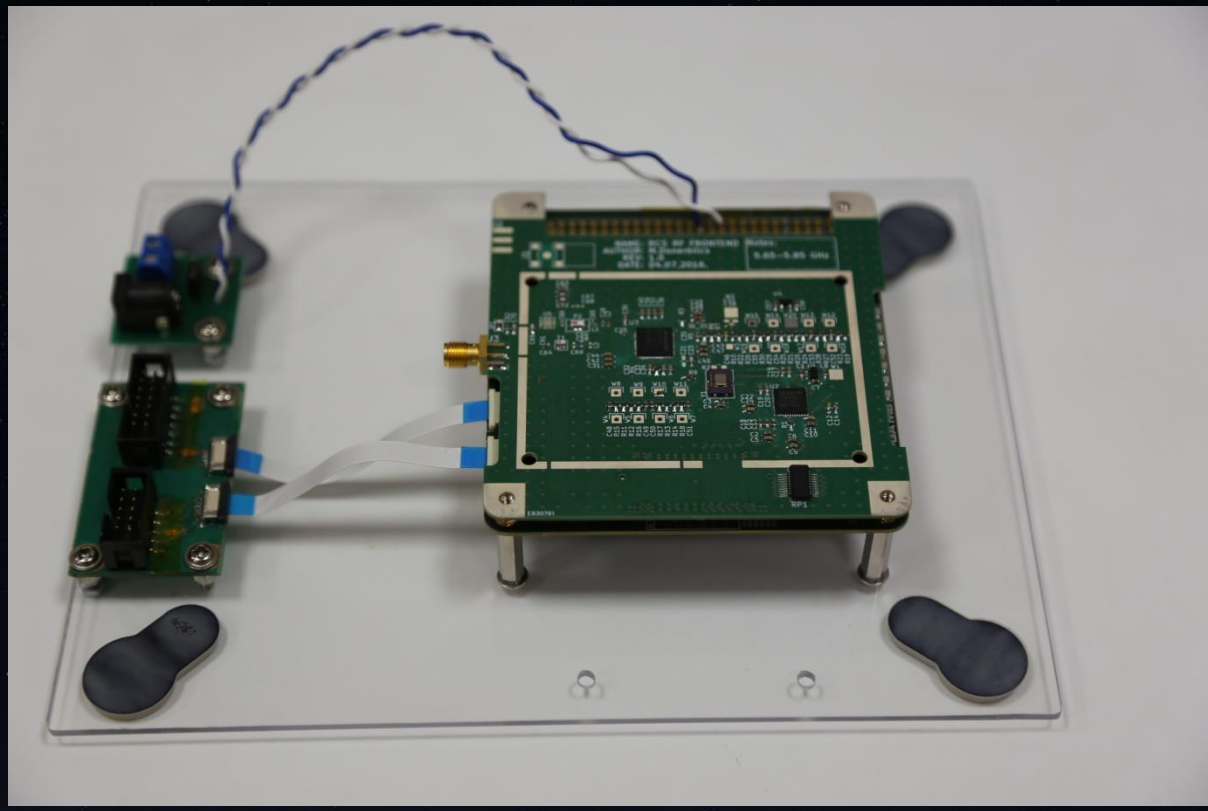
# Spectral imagers



- From Tartu Observatory + ESTCube
- 6 bandpass filters: 442(42), 490(60), 563(90), 663(18), 700(13), 857(30)
- Around 25m ground resolution from 600km height

# High speed communications

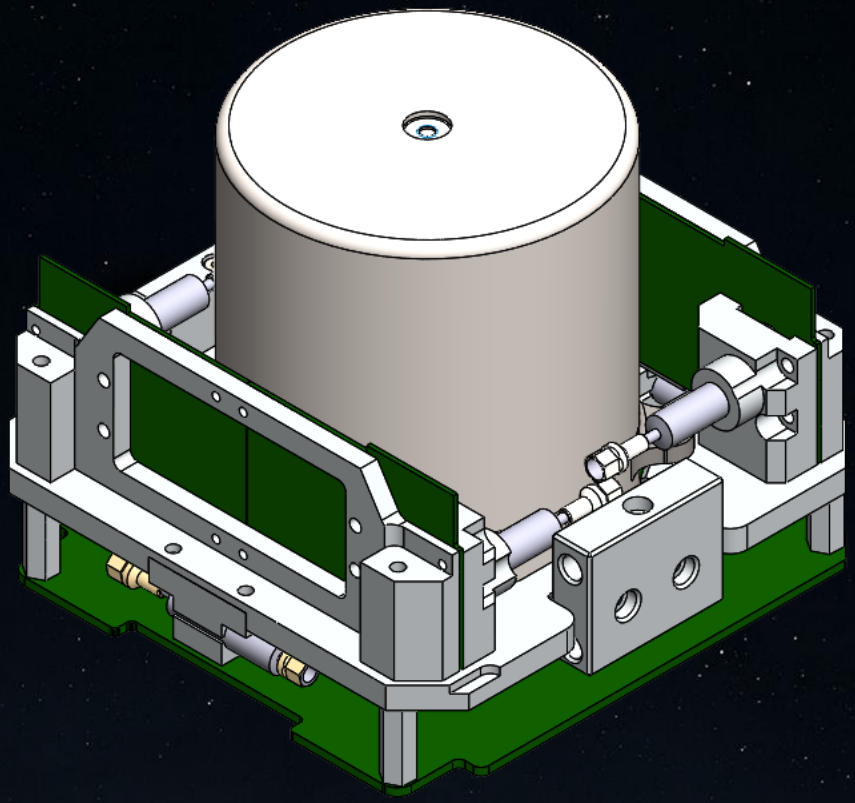
- Developed by Ventspils University College
- C-band
- 5 Mbit/s data download



# Cold Gas Propulsion

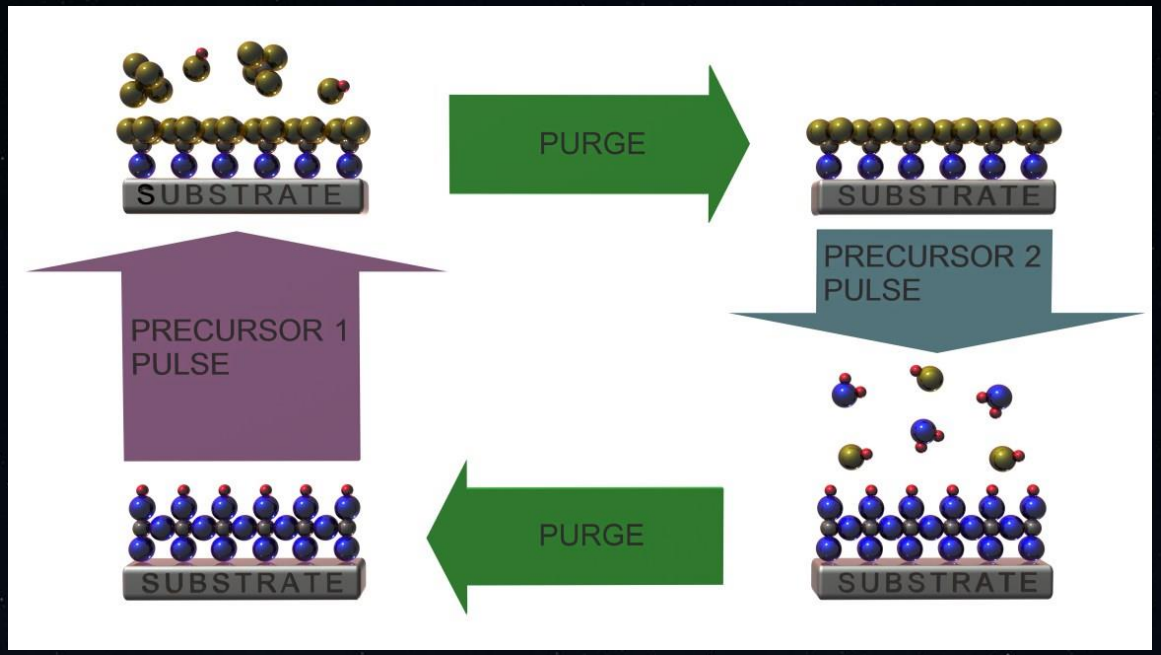
- NanoSpace/GomSpace
- MEMS thrusters
- 4 Nozzles, 2-axis control
- 100g of Butane
- Total impulse 80 Ns

- Used for spin-up



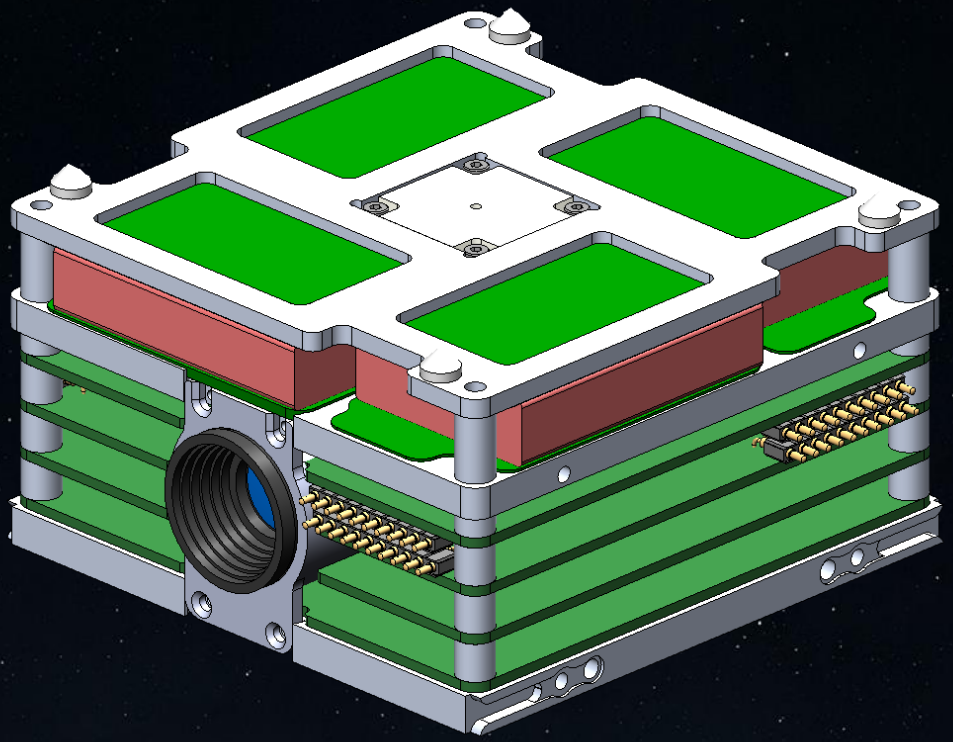
# Corrosion and Radiation Experiments

- Atomic deposition layer coatings
- Experiment 1: Protect against atomic oxygen
- Experiment 2: Very thin radiation protection coating



# Miniaturised Satellite Platform

- 0.6U of 3U CubeSat space.
- Involves reaction wheels, star trackers, all essential subsystems, batteries
- Intelligent sidepanels
- 2.4U for payloads



# The Next Step

# Thank you!