

CZECH SPACE ALLIANCE



**Czech Space Alliance and project of members
cooperations**

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2023

CZECH SPACE ALLIANCE



- Industry association of Czech space companies with proven skills and track record in aerospace business
- Established in 2006
- Now 17 members
- Co-founding member of SME4Space
- Member of International Astronautical Federation



CZECH SPACE ALLIANCE



- **Goals:**

- Members presentation at national and international events
- Dialogue and relationship with similar associations and space agencies
- Develop business relationship with potential partners
- Represent and promote the interests of the space industry to the national decision makers
- Co-operate with the ministries and all other official entities in the formulation of Czech space policy

CZECH SPACE ALLIANCE



- **Actively participates in creating the Czech space strategy by:**
 - Drafting the industry sections of the National Space Plan
 - Participating in the Space Coordination Board of the Minister of Transport
 - Chairing its Industry and Application Committee
 - Consultations with Delegation

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- **Organises, or co-organises:**

- Industry missions abroad (UK, Spain, France, Luxembourg, Italy, USA, Japan, Kanada, Thailand, Brasil...)
- Events in CZ for space companies, associations or agencies from abroad (ESA, ADS, TAS, Italy, GISTDA Thailand...)

- **Participates in and presents itself in:**

- International space conferences and exhibitions (IAC, EU Space Week, SpaceTech...)

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- **17 Members**
- **Main fields of interests:**
 - MAIT –Frentech, OHB Czech, SAB Aerospace, 5M
 - Design –LK Engineering, OHB Czech, SAB Aerospace
 - Manufacturing of structures and mechanism - Frentech, 5M
 - Electronics – Advacam, AVX, BD Sensors, ecs Aerospace, UNITES, TTS
 - Software - Iguassu Software Systems, ecs Aerospace
 - Material development – TOSEDA, TTS, 5M
 - Scientific instruments: Advacam, BBT, Rigaku
 - Testing activities: EGGO Space, Frentech, OHB Czech, TOSEDA, 5M
 - GSE: TERMA, LK Engineering, OHB Czech, SAB Aerospace, UNITES

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- **Products and Competences:**
- Subsystems:
 - Platforms for satellites (built to spec)
 - Launcher dispensers for multiple satellite launch
 - Solar arrays
 - Deployable booms
 - Satellite radiation shielding

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- **Products and Competences:**
- **Components:**
 - GNSS SW for navigations (to vite lepe nez ja)
 - Sensors – radiation detection, moisture, temperature and pressure
 - Electronics and harnesses
 - X-ray and IR optics
 - Supercapacitors and batteries
 - Composite structures and assemblies
 - Hinges for solar arrays end booms
 - Landing legs
 - Mechanisms for cargo doors
 - GSEs – testing and assembly GSE for solar arrays, electronics testing GSE

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- **Products and Competences:**
- **Services:**
 - Design activities – structural, thermal design, kinematics
 - Material development – adhesives and composites
 - Qualification of materials
 - Testing activities – mechanical testing in relevant environment, bake-out, TVC

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Clients and partners



CZECH SPACE ALLIANCE PROJECTS



EVOLUTION

Single components, materials – machined parts, Electronics, harnesses (built to print)

Complex components – mechanisms (Frentech Inext hinges), radiation shielding, scientific instruments

Subsystems (pasive) – VEGA dispenser, PLATO platform, HERA (built to spec)

Subsystems (active) – JUICE magboom, Solarflex, Space rider

Systems – VZLUSat 1, Ambitious projects



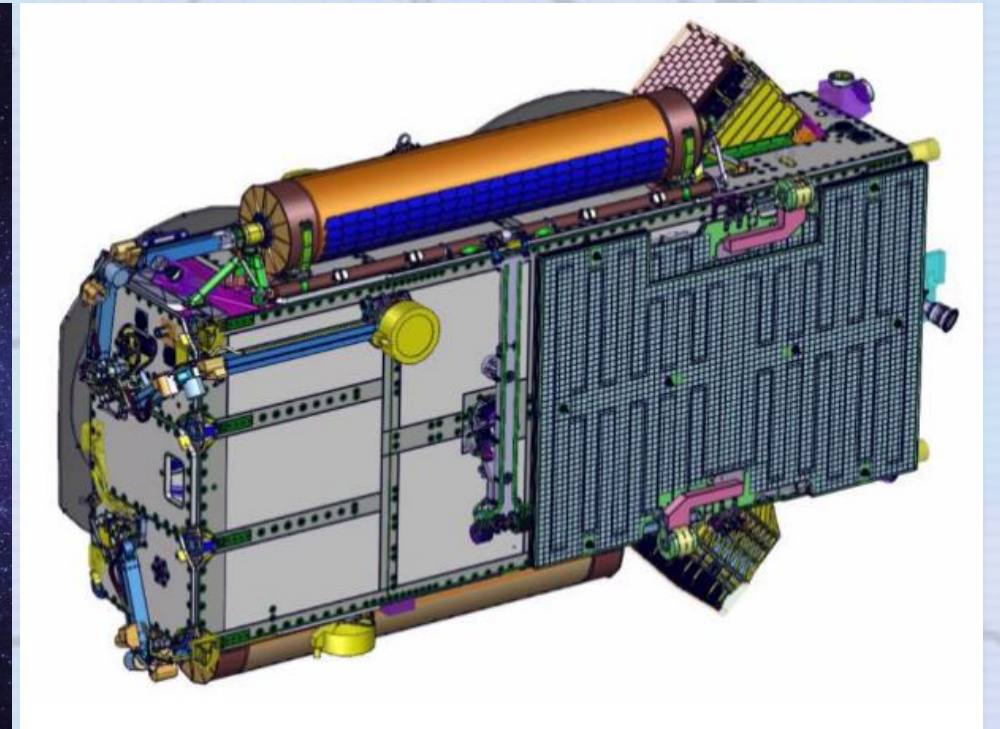
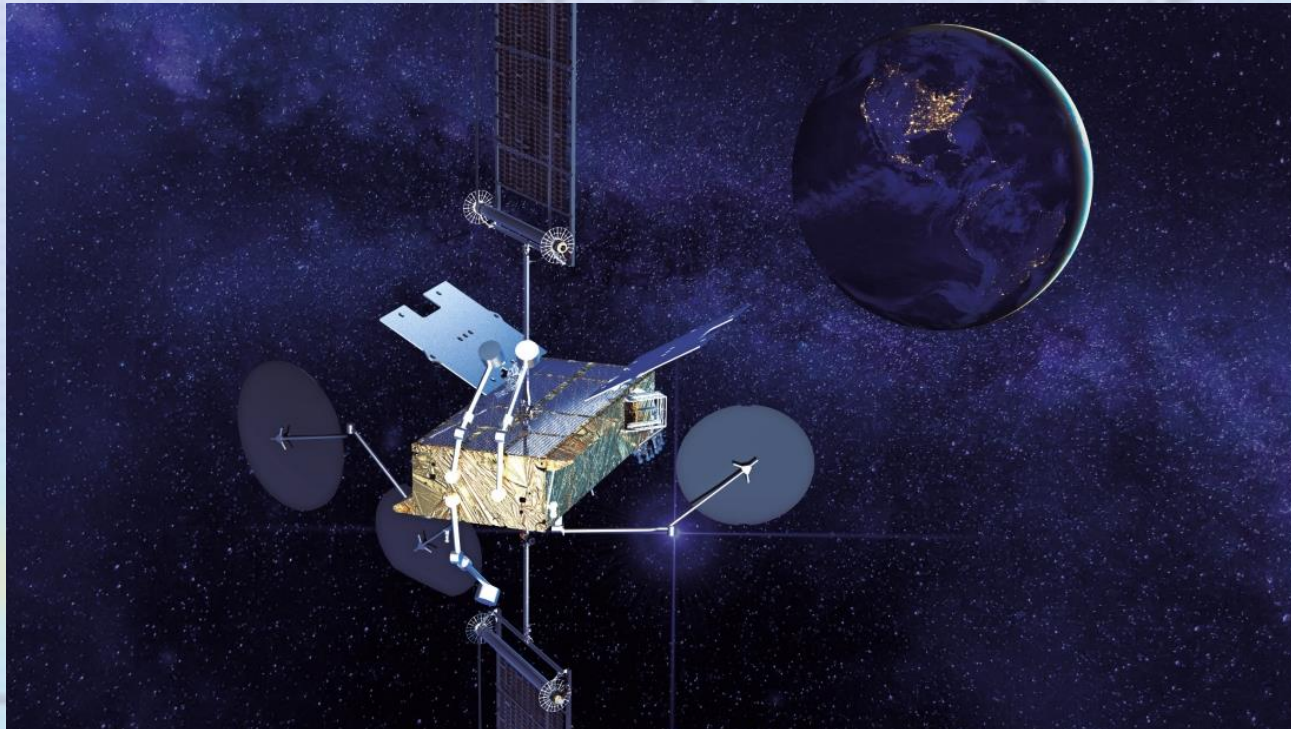
CZECH SPACE ALLIANCE PROJECTS



FLEXIBLE SOLAR ARRAY MECHANICAL SUBSYSTEM

5M, Frentech, LK Engineering, BD Sensors, VZLU

Components from 2013, Subsystem from 2019, Part of NOVACOM II



CZECH SPACE ALLIANCE PROJECTS



FLEXIBLE SOLAR ARRAY MECHANICAL SUBSYSTEM

Wing with dimensions 3x20m

First flight in 2024

Currently present on 5
commercial satellites sold by
Thales Alenia Space France



CZECH SPACE ALLIANCE PROJECTS

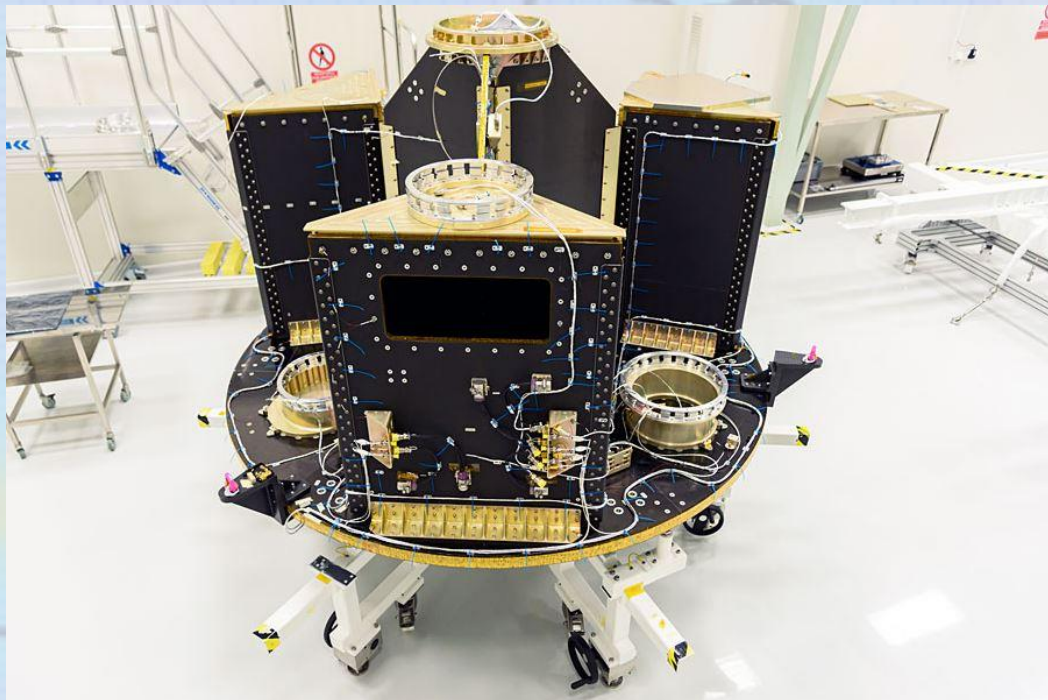


VEGA Dispenser

SAB Aerospace, 5M, Frenotech

Design, manufacturing, AIT

Contract 2015, First flight 2020



CZECH SPACE ALLIANCE PROJECTS

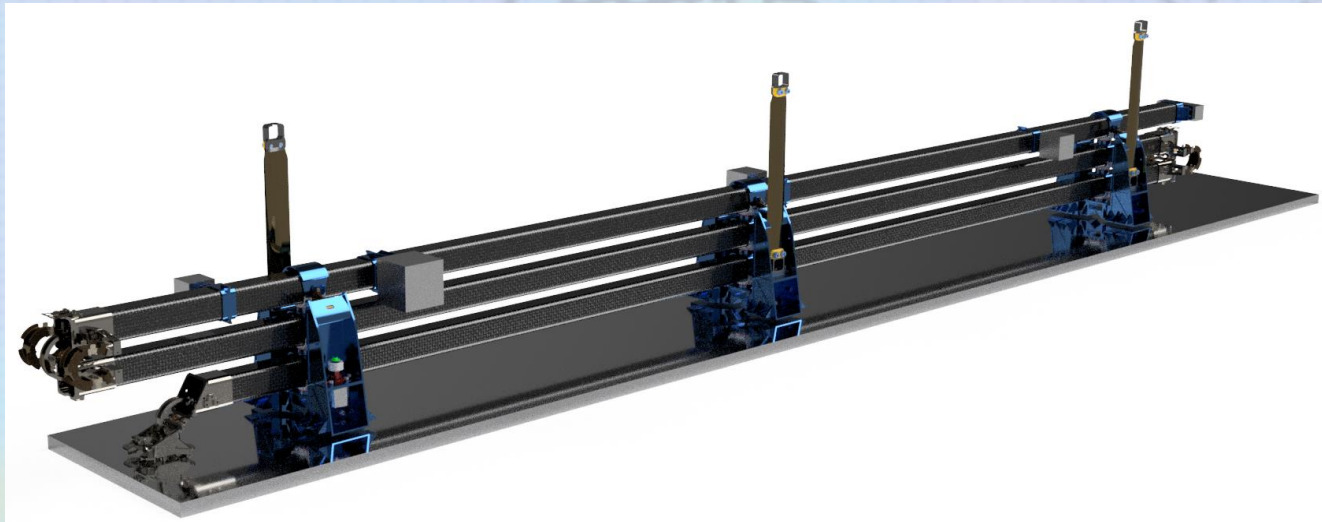


JUICE Mag Boom

Frentech, LK Engineering, 5M, VZLU

Contract 2016, EM model qualified 2021

11m 3-part boom based on SMA and CFRP tubes



CFRP used on REX – Rigaku, VZLU (2019)

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Service Modul for PLATO

SAB Aerospace, 5M, OHB Czech, VUT, Frentech

Design, manufacturing, AIT

Contract 2018, SM model 2022, PFM 2023



CZECH SPACE ALLIANCE PROJECTS

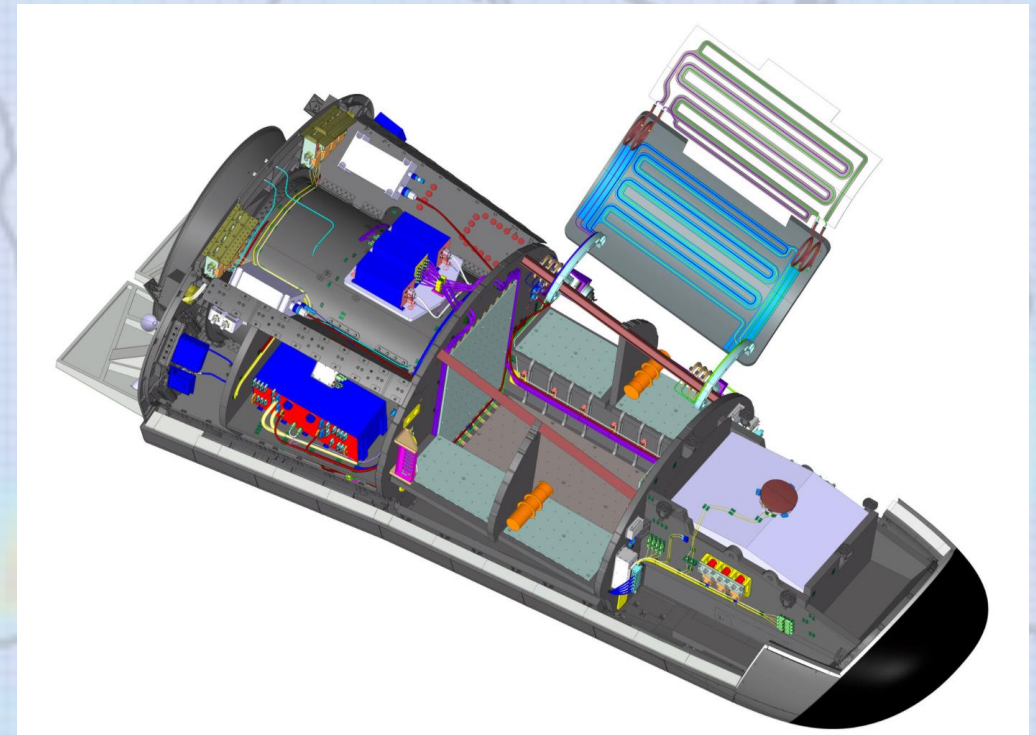


Space Rider mechanism development

Frentech, LK Engineering, esc

Design, manufacturing, AIT of cargo door and landing gear

Contract 2019, PFM 2024



CZECH SPACE ALLIANCE PROJECTS



Space radiation capabilities, technologies and platforms for small spacecraft and CubeSats (SR-CTP)

RIGAKU, TTS, VZLU, BD Sensors, 5M, Advacam, HVM Plasma

Contract 2018 – 2022

RADIATION SHIELDING (5M)

X-RAY OPTICS (Rigaku)

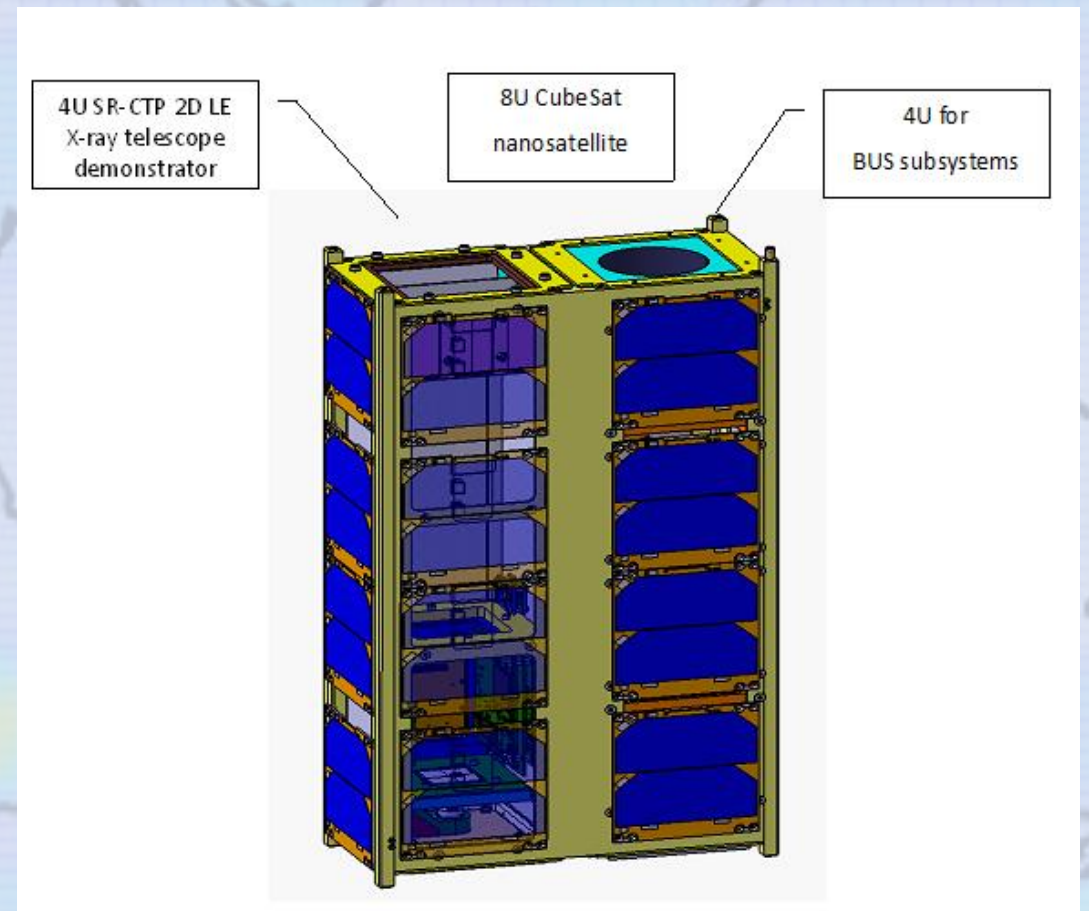
RADIATION DETECTOR PLATFORMS (Advacam)

RADIATION ADAPTED ELECTRONICS

OUTGASSING SENSORS (TTS)

SOLDERING TECHNIQUES (BD Sensors)

X-RAY TELESCOPE DEMONSTRATOR (Rigaku + Advacam)



CZECH SPACE ALLIANCE PROJECTS

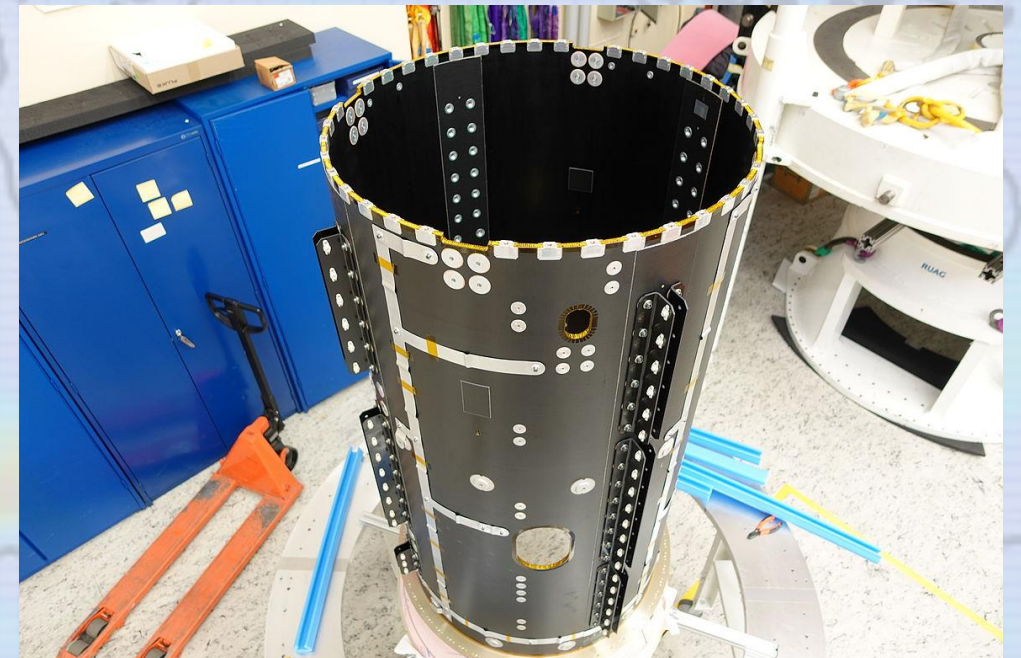
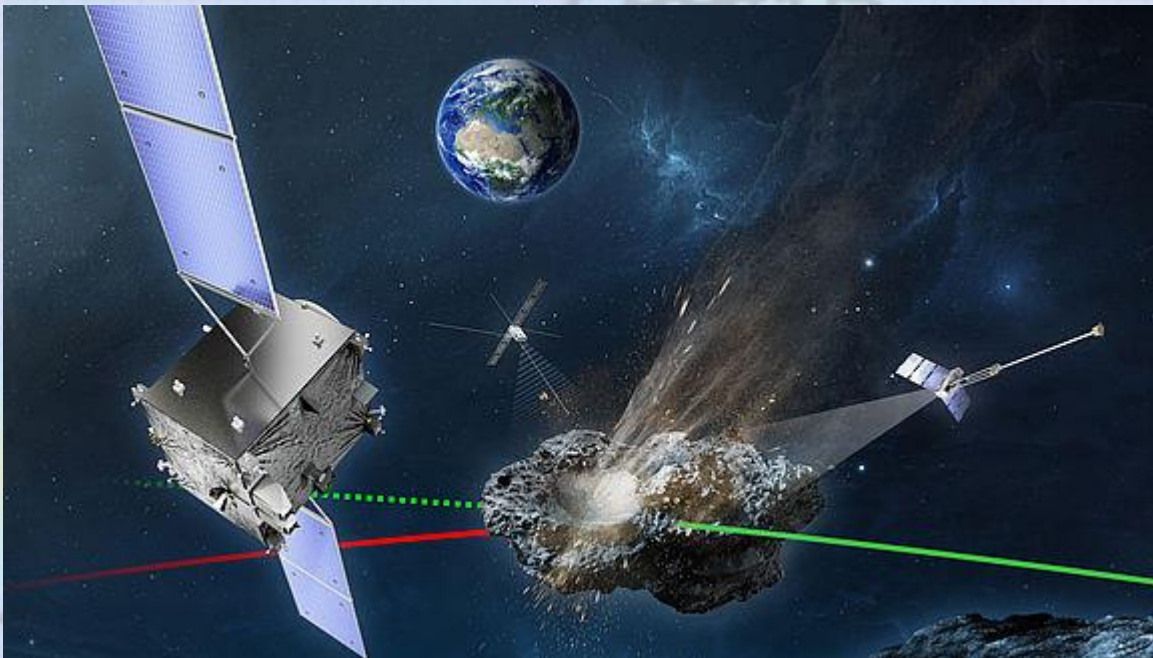


HERA B2/C/D

OHB Czech, Frentech, LIAZ

Design and manufacturing of structural subsystem

PFM delivered 05/2022, flight 2024



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VZLUSAT1

VZLU, RIGAKU, TTS, 5M, IST, CVUT, ZCU, HVM Plasma

BD Sensors, Frentech

Contract 2014 – 2017, flight 23.6.2017

X-RAY OPTICS (VZLU, Rigaku)

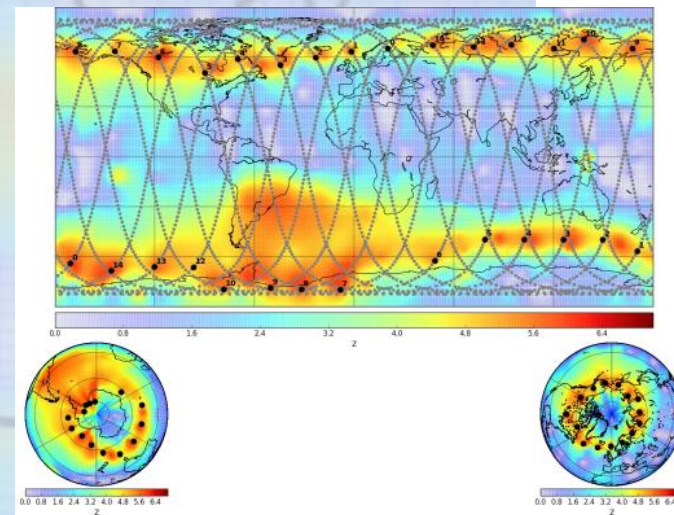
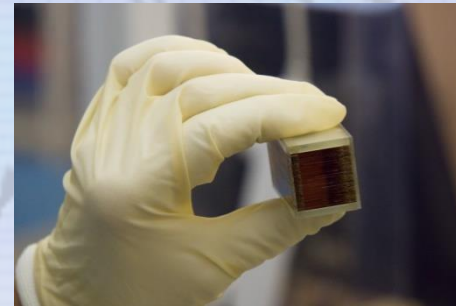
RADIATION SHIELDING (5M)

RADIATION DETECTOR (Advacam)

OUTGASSING SENSORS (TTS, IST)

In orbit CFRP mechanical testing (VZLU, Rigaku, 5M)

Solar panels (5M)



CZECH SPACE ALLIANCE PROJECTS



CZECH AMBITIOUS PROJECTS

Czech system on orbit

New phase of cooperations

- Missions with a scientific element
- Technical missions
- 400.000 € for study covering Phase 0, A and B1 of a mission development
- 7 different studies
- 1-2 will be chosen
- Very dense net of cooperation between industry and academia

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- 5M
- Advacam
- AVX
- BBT
- BD Sensors
- EGGO
- Evolving
- Frentech
- Iguassu
- L.K.Engineering
- OHB Czech
- Rigaku
- SAB Aerospace
- TERMA
- Tosedá
- TTS
- Unites



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