

INNOVATIVE SOLUTIONS FOR SPACE

HUNGARIAN SPACE CLUSTER

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HUNGARIAN SPACE CLUSTER

- HUNSPACE - Hungarian Space Cluster

- ✓ Established in 2007
- ✓ Accredited in 2014
- ✓ 32 members



- SME4SPACE membership

- Purpose: to include the most participants of the Hungarian space industry

- Cluster-committee: Representatives of each section of the cluster

- ✓ Satellite components,
- ✓ Electronics,
- ✓ Earth observation,
- ✓ Educational research and dissemination



PROFILE OF MEMBERS

SPACE INDUSTRY

UPSTREAM

DOWNSTREAM

SATELLITE COMPONENTS

- Equipment for Sentinel-2 satellite (2009-2010)
- Foaming experiment on ISS
- CHEOPS- Characterising Exoplanet Satellite
- *Prime in cluster: Admatis Ltd.*

SMALLSATS (SATELLITE AND AVIONICS)

- On-board Chip based AI accelerator technology
- RADCUBE Space weather CubeSat
- 3/6/12/16U CubeSat platform providing
- Short term access to space services – Shared Payload Solutions
- Class 1 component based power distribution and OBDH
- *Prime in cluster: C3S LLC.*

EARTH OBSERVATION

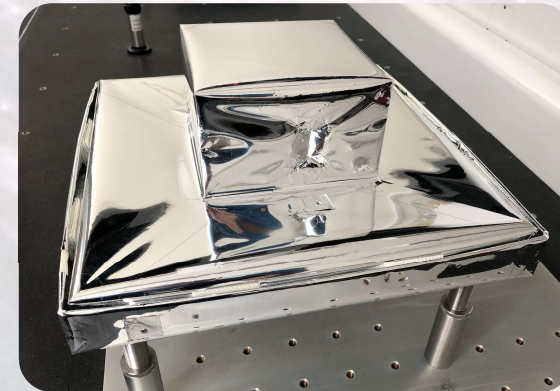
- Distributing satellite images
- Positioning, measurements (GNSS)
- European Common Agricultural Policy (CAP): CwRS, LPIS
- Use of Copernicus data in implementations
- Technological development (EOK-EKAT, T-BEA)
- *Primes in cluster: Airbus DS Geo Hungary, Lechner, GeoData Ltd.*

R&D, DISSEMINATION AND EDUCATION

- Bone Tissue Engineering in Space (BONES)
- On-site bone reconstruction and fast osseointegration during human spaceflights
- Method for producing metal foam
- *Prime in cluster: Bay Zoltán Nonprofit Ltd.for Applied Research*

SATELLITE COMPONENTS

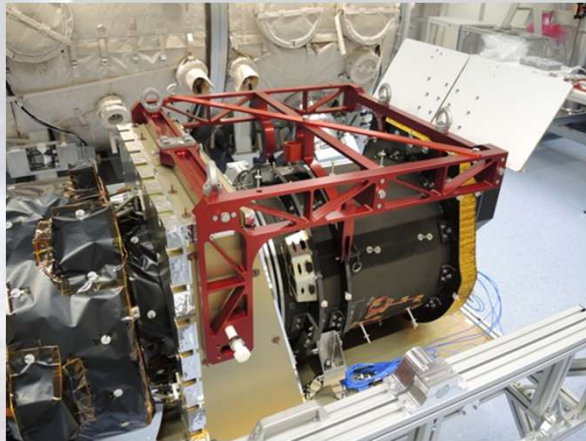
- Self-standing 3D-shaped thermal isolation based on **aerogel** core (TRL4 LEVEL).
- Thermal performance testing (ESA-ESTEC premise *Admatis Ltd*)



- Power distribution unit for 26 cameras - Ancillary Electrical Unit (AEU) (prototype for ESA's PLATO 2.0, C3S LLC)

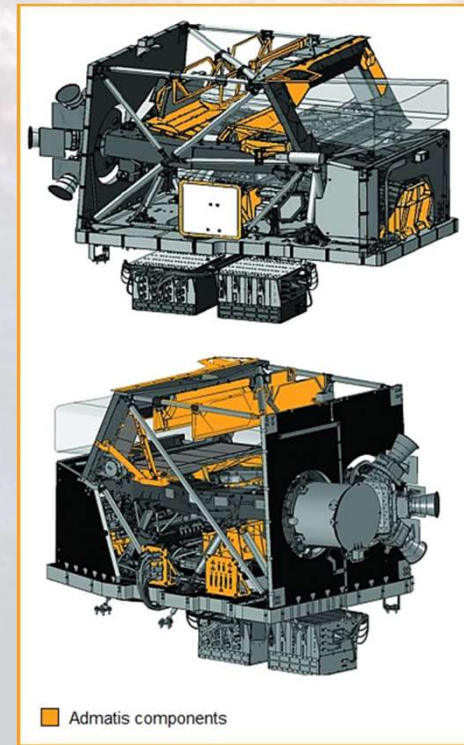
SATELLITE COMPONENTS

- **Primary payload power supply** (TRL4) for SMILE mission
Successor: Complex DCDC Converter up to TRL6 (C3S LLC)
- **Mechanical and thermal equipments** for Sentinel-2's MSI (*Admatis Ltd*)
- **Radiators** for ESA's Cheops (*Admatis Ltd*)



CHEOPS

Sentinel-2
satellite
MSI-MMTH



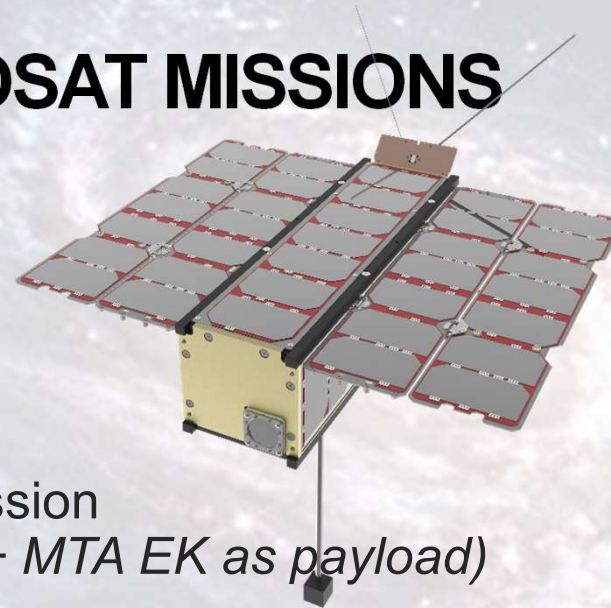
SMALLSATS: SATELLITE TECHNOLOGY

Scalable 3U, 6U, 12U, 16U platforms
with redundant satellite subsystems (C3S
LLC)

RADCUBE Flight Model

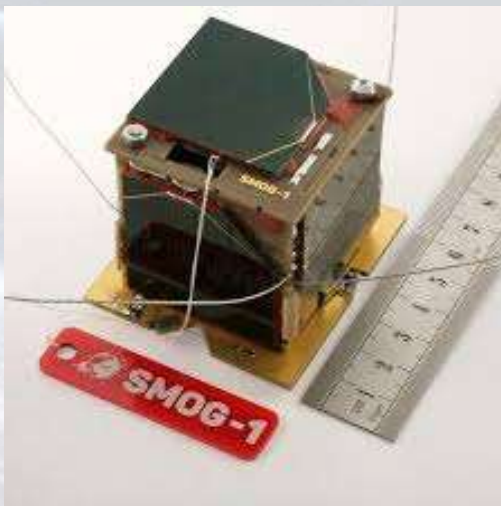


SMALLSATS: NANOSAT MISSIONS

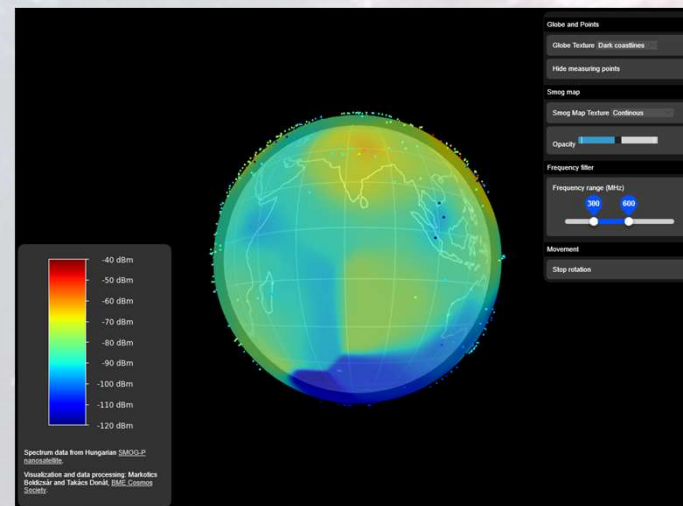


RADCUBE

radiometric measurements ESA Mission
(ESA mission: C3S LLC as Prime + MTA EK as payload)



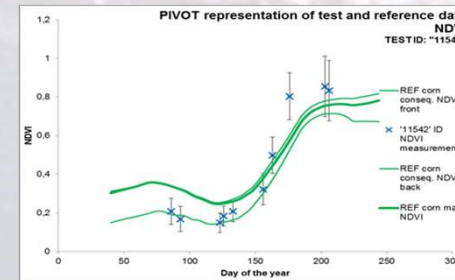
SMOG-1
SMOG-P
(BME)



EARTH OBSERVATION SERVICES

- Satellite **image analysis** (multipectral+radar)
- **Crop detection** analysis (CwRS).
- Automated and continuous **change detection** (agriculture, land use).
- (Organic) **farming support** – ESA development
- **Monitoring electric network** service areas (E.ON)

(GeoData Services Ltd., Budapest)



R&D: LABORATORY SERVICES FOR SPACETECH RESEARCH

- Mechanical testing (tensile-, fatigue, components, metallography)
- Nanomaterials and nanometrology
- Electro-chemical testing (corrosion, coatings, TGA, DTA, etc.)
- Industrial laser technologies
- NDT testing
- VR services (CAD, simulations, complex failure cases, etc.)



(Bay Zoltán Non-profit Ltd., Laboratories in Budapest, Miskolc)



THANK YOU FOR YOUR ATTENTION!

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