

# Romanian Space Catalogue



**Version 2.0 March 2025**

**Welcome to the Romanian Space Catalogue, a concise introduction to some of Romania's key players in the space industry.**

**As Romania's presence in space continues to grow, this catalogue offers a brief overview of select entities in the sector.**

**The catalogue contains entities working closely with the European Space Agency (ESA), showcasing Romania's integral role in ESA collaborations.**

**Designed as a starting point, it provides a glimpse into the nation's contributions to space exploration.**

**We look forward to expanding this catalogue in the future to include more of Romania's space ventures.**

**Catalogue Creator**

**Moon Girl of Betelgeuse Space**

**under ESA Contract 4000142962/23/NL/MH/mp**

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**The information contained in this catalogue has been collected on the basis of data provided voluntarily by the entities presented in the catalogue.**

**Credits SlidesCarnival**



## Table of contents

<b>AEROSTAR</b>	<b>6</b>
<b>AROBS Engineering</b>	<b>8</b>
<b>ATD Aerospace</b>	<b>10</b>
<b>BITNET CCSS</b>	<b>12</b>
<b>COMOTI</b>	<b>14</b>
<b>CDS</b>	<b>16</b>
<b>CS Group Romania</b>	<b>18</b>
<b>DEIMOS Space</b>	<b>20</b>
<b>EMSIL Group</b>	<b>22</b>
<b>EXCENT Ingénierie Roumanie</b>	<b>24</b>
<b>GMV Innovating Solutions</b>	<b>26</b>
<b>GONZALES</b>	<b>28</b>
<b>HPS Romania</b>	<b>30</b>
<b>ICPE Electric Motors</b>	<b>32</b>
<b>IMT - National Institute for R&amp;D in Microtechnologies</b>	<b>34</b>
<b>INCAS - National Institute for Aerospace Research Elie Carafoli</b>	<b>36</b>
<b>INFLPR - National Institute for Laser, Plasma &amp; Radiation Physics</b>	<b>38</b>
<b>INOE 2000 - National Institute of R&amp;D for Optoelectronics</b>	<b>40</b>
<b>ISS - Institute of Space Science</b>	<b>42</b>
<b>LASTING SOFTWARE</b>	<b>44</b>
<b>PRO OPTICA</b>	<b>46</b>
<b>RARTEL</b>	<b>48</b>
<b>RISE</b>	<b>50</b>
<b>ROSEAL</b>	<b>52</b>
<b>SAB Aerospace</b>	<b>54</b>
<b>SONACA Romania</b>	<b>56</b>
<b>SONOVISION Romania</b>	<b>58</b>
<b>TERMA Space Romania</b>	<b>60</b>
<b>TERRASIGNA</b>	<b>62</b>
<b>THALES Romania</b>	<b>64</b>
<b>TTTECH Development Romania</b>	<b>66</b>



**AEROSTAR**



## DESCRIPTION

Aerostar S.A. is a leading Romanian aerospace and defence company having as main business lines manufacturing aeronautical and space products, MRO civil aviation and defence systems - integration, manufacturing, upgrades and maintenance. The company is an approved subcontractor for the global aviation industry and manufactures aviation components and aerostructures, landing gears and hydraulic systems. Aerostar holds approval and supplies maintenance and conversion services for civil aircraft.

The company provides base and heavy maintenance for Boeing 737 all series, Max Family, Airbus 320 Family ceo & neo. Aerostar is part of the National Defence Industry being designated the Maintenance Centre for the F-16 aircraft in the inventory of the Romanian Army.

The main activities in the field of military aviation and defence are: MRO and Upgrades of military aircraft and engines; Electronic Systems – Design, Production and Integrations in the field of primary and secondary radar systems and IFF (Identification Friend-or-Foe) systems and equipment, including repairs, upgrades and logistic support; Ground defence systems and platforms: the integrator of the modernization national artillery system at NATO standards; Design and production capabilities for MGSE, build-to-spec, including in the aeronautical and satellite industry.



## PRODUCTS & SERVICES

### Ground Segment:

- Mechanical Ground Support Equipment & Products (MGSE) for satellite and space systems.
- Aluminium and steel parts & small subassemblies for Launchers (solid and liquid boosters)

### Non-space:

- Aerostar holds authorizations for the manufacture of products, parts and equipment for Part-21G civil aircraft and for the maintenance of civil aircraft components Part-145 granted by the Romanian Civil Aviation Authority and the FAA. Aerostar also holds the Part-21J authorization as a design organization, issued by EASA (European Design Agency).
- Aerostar has NADCAP accreditation for: heat treatments, chemical processing, shot peening, NDT, welding.



## TECHNOLOGY

- TD 7 Electromagnetic Technologies and Techniques (TRL 7)
- TD 12 Ground Station System and Networks (TRL 8)
- TD 15 Mechanisms (TRL 8)
- TD 20 Structures (TRL 4)
- TD 24 Materials and Manufacturing Processes (TRL 6)



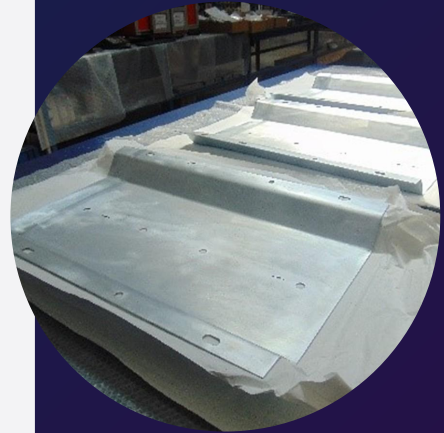
## PROJECTS AND REFERENCES

- INTEGRATION MGSE for EUROSTAR NEOSAT - Spacecraft integration, to assemble the Plasma Thruster Module on Deployment and Point System and to integrate the Deployable Thruster Module Assembly on Spacecraft, under zero Gravity. Designed under customer specifications.
- DEPLOYMENT MGSE for EUROSTAR NEOSAT - Spacecraft tests, to deploy the Deployable Thruster Module Assembly around RA1 and RA1/RA2/RA3 axis, under zero Gravity. Designed under customer specifications.
- JIG for EUROSTAR NEOSAT deployment - Spacecraft tests, to support the Deployable Thruster Module Assembly during deployment around RA1 and RA1/RA2/RA3 axis, under zero Gravity. Designed under customer specifications.
- TILTING TROLLEY for EUROSTAR NEOSAT battery pack - Spacecraft integration and tests, to assemble the Battery Modules on Battery Module Panel, to support the Battery Module Assembly during electric and acoustic test and to integrate the Battery Module Assembly on the Spacecraft, under zero Gravity. Designed under customer specifications.
- Ariane 5, Parts and assemblies for: Engine Thrust Frame (ETF); First Stage BME; Second Stage ESC; customer: Fokker Aerostructures.
- Ariane 6, Parts and assemblies for: ULPM - Upper Liquid Propulsion Module; LLPM - Lower Liquid Propulsion Module; ESR - Equipped Solid Rocket (Solid Booster); Customer: Ariane Group.
- Stand-alone IFF Interrogator Ground System (SIGS) - Build-to-Spec
- SIGS Design, Manufacturing and Qualification; Included development of command, control, data fusing and tracking Software.
- EMIGS – Equipped Mast for Interrogator Ground Station - Build-to-Spec. EMIGS Design, Manufacturing and Qualification; Included development of MMI Software for command and control.



## EQUIPMENT & LABORATORIES

- Specialized shops and related engineering for: Aerospace manufacturing, MRO Commercial Aviation, Defence Systems - Production, maintenance, upgrades, development and integrations, integrated logistic support.
- Support Facilities: ERP integrated function, Special Process, Laboratories including Calibration Services, test, measurement, verification and inspection facilities, NDT; stores and warehousing facilities.



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**DESCRIPTION**

Embedded Software company that specializes in professional services and SW products – all focused on the low level/close-to-hardware topics and that optimize HW performance and security and address the high criticality systems of many verticals (AeroSpace, Automotive, Medical, IoT etc.).

The company has 25+ years of experience working in partnership with the major HW vendors (NXP, TI, LSI, Infineon, Xilinx, Gaisler etc.) and on the major (RT)OS systems (embedded Linux, RTEMS, VxWorks, QNX, FreeRTOS, PikeOS, PXROS, etc.)

**PRODUCTS & SERVICES****Flight Segment:**

- Embedded Real Time Operating systems and SW tools/stacks
- Linux solution for space systems (LEON4/5, ARM, RISC-V)
- Image compression space-ready algorithms
- On-board parallel processing
- On-board vision based navigation
- Space2Space and Space2Ground communication (CFDP)

**Ground Segment:**

- Ground Station Systems and Networks
- Cybersecurity (CSOC option for space entities)

**Non-space:**

- High criticality software for:
  - Medical devices (infusion pumps, wearables, rapid-diagnosis systems)
  - Navigation (maritime systems)
  - Automotive (BSW, AUTOSAR, ASIL-D, A-spice)
  - Video equipment (Linux-enabled IP cameras, high end industrial displays, infrared cameras etc.)

**TECHNOLOGY**

- TD 2 Space Systems Software (TRL 3-8)





## PROJECTS AND REFERENCES

- “ISVV for OBSW for SpaceRider” - AROBS is leading the consortium performing this ISVV project for the entire on-board application SW for the SpaceRider mission
- “ClearSpace-1 mission – SW development and testing of the embedded RV Sensors Processing Unit (RVSPU) algorithms” - AROBS is in charge of the development of the Application SW for the entire RVSPU unit.
- “Optimized multicore implementation and benchmark for on-board image compression algorithm 123.0-B-1 and B-2 – on dedicated space HW” - AROBS won these 2 projects as Prime – and have done the first space application solution of a multi-core on-board hardware platform, with implementations and benchmarks on GR740, P4080 and x86. Their on-board SW module for image processing is used by the UNIBAP private missions and is targeted to be used in the Lagrange L5 mission.
- Porting Eagle-Eye to an ARM-based Processor” - AROBS was responsible with the analysis and solution validation for the Arm CortexR solutions to be used as hardware platform for porting the Eagle-Eye mission simulation.
- “Linux TSP solution for space” & “Debug & trace tools for RTOSes on GR740 space platform” - Both projects mentioned above are done with AROBS as prime in partnership with Gaisler – and involve a first time development and validation of a Linux based TSP partition for space applications and new RTOS KRNs (Atomthreads, FreeRTOS, Zephyr) and debug/profiling solutions.
- “Implementation of CFDP and Integration into an on-board software application framework providing time and space partitioning” - AROBS won this project as Prime in partnership with Airbus – and the solution created was a file transfer protocol implementation and validation for ground<->spacecraft I/O.

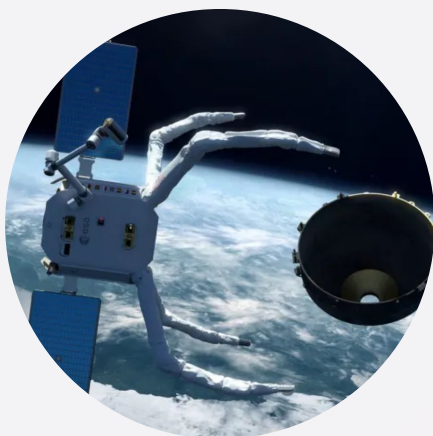


Photo: ClearSpace SA



Photo: ©ESA / SpaceRider



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## ATD AEROSPACE



### DESCRIPTION

ATD AEROSPACE RS SRL is a Romanian SME specialized in propulsion and autopilot development including both hardware and software elements. The company has been involved in development of solid rocket motors, liquid rocket engines and specialized guidance packages for high altitude UAVs, missiles and missile related systems. On the propulsion side, a selection of previously implemented activities is the following: 30 mm to 240 mm solid rocket motors, 0.5 kN, 1 kN, 6.5 kN and 8 kN pressure-fed hypergolic storable liquid rocket engines, development on 1 kN LOX/hydrocarbon thrusters (specimens for static testing), test stand instrumentation development and customization for various propulsion testing applications. On the autopilot/GNC side, a selection of implemented activities is the following: high altitude UAV (35 km operational altitude), Mach 4 GNC for customized project, advanced kinematic GNC for Neuro-Core computer applicable to customized missile projects, on-board flight management system with dedicated flight events, drivers and interfaces for various hardware components.



### PRODUCTS & SERVICES

#### Flight Segment:

- Autopilot/GNC systems tested in flight for altitude range 0-35 km and speed range: 0 - Mach 4
- Flight dynamics software applicable to UAVs, guided parachutes, missile systems
- Flight prediction software (including re-entry module applicable for ballistic and quasi-ballistic flights)
- Onboard instrumentation package/flight management system (both manual and autonomous)

#### Ground Segment:

- 3/5/6 DOF simulators with high fidelity aerodynamics module
- Flight data processing
- Ground station: VHF/UHF/S-band – support of high altitude missions; Testing of onboard systems (including RF testing)

#### Propulsion

- Solid rocket motors: design, manufacturing and testing
- Liquid rocket engines: design, manufacturing and testing
- Test stand integration, test stand instrumentation design/customization



### TECHNOLOGY

- TD 19 Propulsion (TRL 6-9)
- TD 10 Flight Dynamics and GNSS (TRL 9)
- TD 15 Mechanisms (TRL 6-9)
- TD 18 Aerothermodynamics (TRL 5-7)
- TD 26 Others



## PROJECTS AND REFERENCES

- 1 kN and 6.5 kN liquid rocket engine - support of ADAMP (ESA)
- 0.5 kN liquid rocket engine – national project
- 23 kN booster development – inflight measurement (ESA)
- REVLANGNC (GSTP) – GNC for atmospheric re-entry (ESA).  
Prime: Deimos Romania SRL
- Flexible wing UAV (ESA) – Prime contractor: ROMSPACE
- Instrumentation package non-guided rocket - national project
- Boost assist rocket motor – national project
- Nozzle adaptation for large caliber motor – national project



## EQUIPMENT & LABORATORIES

- Composite workshop: vacuum lamination, thermal treatment
- Metallic workshop: CNC milling/lathe machines, toothing machines FD800/FD400, radial drilling machine, parallel lathe SNA 800X5000; 600X3000; 560X2000; 480X2000, standard lathe type DLZ 603, round rectifying machines RO350, plane rectifying machines, boring and milling machine AF85 and AF90
- UAV HILSIM facility and electronics workshop for SMD and non-SMD prototyping



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### DESCRIPTION

BITNET-CCSS (Centrul de Cercetari Senzori & Sisteme) SRL is a small private company registered in Cluj, Romania, which is active since 1993 in the field of consulting, research and technology demonstration.

BITNET was involved in the development of the Romanian space program and has completed more than 50 R&D projects until today, many of them in partnership with Romanian authorities, universities, research institutes or other companies. BITNET is involved in space related international projects and activities, including cooperation with ESA, NATO, EC.

Main research and business area in the last 15 years: SST (Space Surveillance and Tracking) of artificial space objects. Especially design and development and testing of new SST passive optical and radio sensors for satellite detection. Many of these projects are implemented in cooperation with our partners in Cluj: The Astronomical Observatory of the Romanian Academy-Cluj branch and the Technical University Cluj.

In 2006, NATO published a BITNET paper on developing a common SST infrastructure. In 2007, BITNET contributed to NATO's first space object surveillance experiment using a small satellite, with funding from Canada/DRDC and U.S. technical support. This marked the start of BITNET's cooperation with NATO, followed by collaborations with ESA and the European Commission.



### PRODUCTS & SERVICES

#### Space Situational Awareness

- New passive optical and radio SST sensors design/mostly conceptual approach
- New SST sensors integration (using critical components provided by third parties)
- Field experiments / technology demonstration/sensors performance estimation – using known space targets (satellites), not simulations.



### TECHNOLOGY

- TD 11 Space Debris (TRL 5-6)





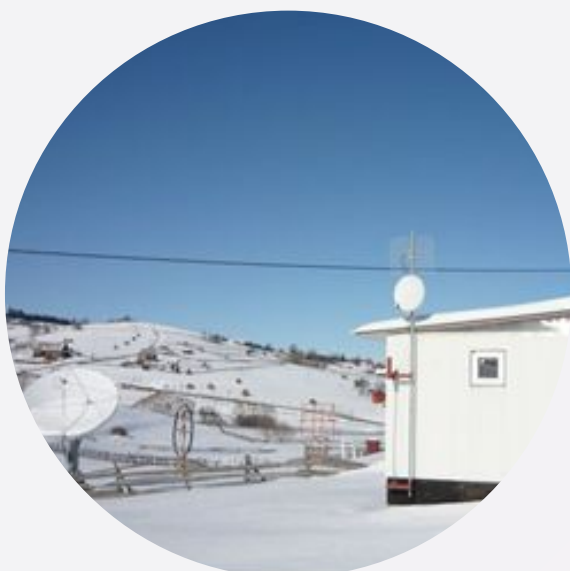
## PROJECTS AND REFERENCES

- SDR-based multi-feed reception system for SST (2019-2021-2022). ESA contract, with BITNET as sub-contractor of the Technical University of Cluj.
- SSA P3-SST-IV – Tracking radar retrofit for CHEIA (2018). ESA contract, with BITNET as sub-contractor of RARTEL (TELESPAZIO Group).
- GENDARED (2016-2017): Generic Data Reduction framework for Space Surveillance. ESA contract, with BITNET as sub-contractor of GMV Romania.
- TELECAL (2015-2016): Angular Position Measurement of Galileo Satellite with Telescopes. ESA contract, with BITNET as prime.
- CHEIA ANTENNA RETROFIT (2015-2016). ESA contract, with BITNET as sub-contractor of RARTEL (TELESPAZIO Group).
- SSA for ROMANIA (2014-2015). ESA contract, with BITNET as sub-contractor of RARTEL (TELESPAZIO Group).
- Many other national funded SST projects and participation to NATO S&T activities in this field.



## EQUIPMENT & LABORATORIES

- BITNET has its own research infrastructure. The most important is a testbed for SSA and radio experiments (in the mountains, some 50 Km away from Cluj-Napoca, low noise environment, including an astronomical observatory and small-to-medium size antennas from VLF to Ku band). BITNET has also access to complementary facilities belonging to project partner organizations in Cluj.



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**COMOTI**  
ROMANIAN RESEARCH &  
DEVELOPMENT INSTITUTE FOR  
GAS TURBINES

## COMOTI



### DESCRIPTION

COMOTI seamlessly integrates scientific research, engineering, technological design, manufacturing, and testing across aerospace, defense, and energy sectors. For the space domain, COMOTI focuses on developing various equipment, including mechanisms, pumps, propulsion systems, cryo-tank components, composite and metallic structures, MGSEs, a turbopump test bench and others.



### TECHNOLOGY

- TD 7 Electromagnetic Technologies and Techniques (TRL 3)
- TD 8 System Design & Verification (TRL 9)
- TD 15 Mechanisms (TRL 5)
- TD 19 Propulsion (TRL 4-6)
- TD 20 Structures (TRL 3)
- TD 21 Thermal (TRL 3)
- TD 24 Materials and Processes (TRL 3)



### PRODUCTS & SERVICES

#### Flight Segment:

- S/C equipment: mechanisms (sealing and closing systems, HDRMs), centrifugal pumps for MPFL systems, metallic antenna reflectors, composite and metallic structures;
- S/C propulsion: helicon plasma thruster, green thruster (water electrolysis), pulse detonation thruster;
- Propulsion for launchers: cryo-tank diffusers and anti-vortex devices for launchers (future versions of Ariane 6), 30 kN LOX/LCH4 upper stage;
- Additive manufactured components (ECSS qualified processes).

#### Ground Segment:

- Dedicated MGSEs (tilting trolleys, stands, adaptors, lifting devices, clamp bands, structural dummies), transport containers and testing facilities;
- Turbopump test bench (in similitude conditions).

#### Non-space:

- Composite structures for aviation;
- Propulsion systems based on gas turbines for marine applications;
- UAV - multirotor drones;
- Experimental gas turbines components and assemblies;
- Large testing infrastructures for gas turbines, combustion chambers, compressors, seal labyrinths, acoustic and vibrations, physical and mechanical testing;
- Gas compression equipments (screw or centrifugal compressors);
- Cogeneration plants.



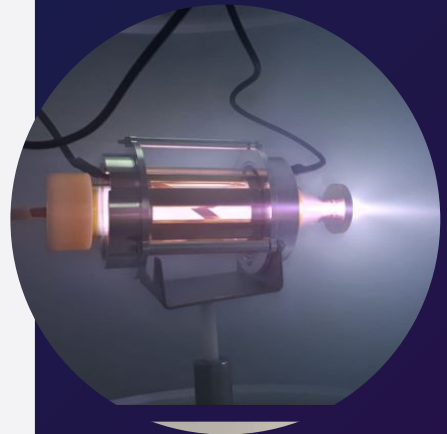
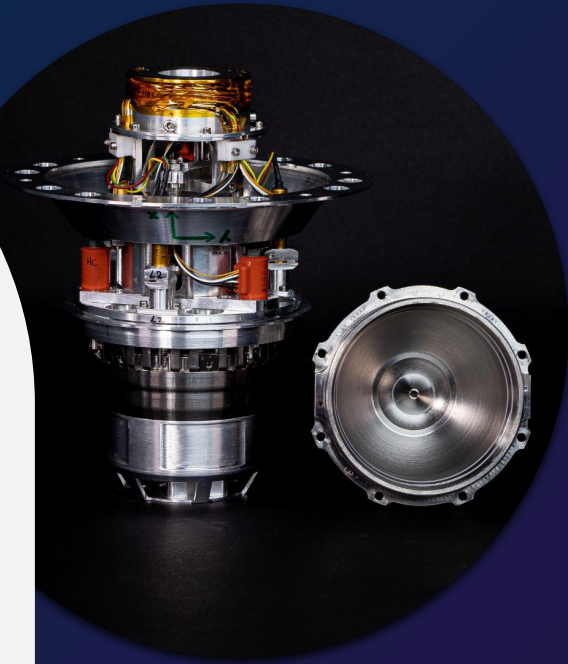
## PROJECTS AND REFERENCES

- Hold Down and Release Mechanisms of the Sample Transfer Arm – Mars Sample Return ESA/NASA mission;
- SCOUT – Low cost metallic cryotank technology for future versions of Ariane 6 launch vehicle - ESA (FLPP);
- Centrifugal pump EM for Mechanically Pumped Fluid Loop Systems - ESA (GSTP);
- JUICE WRTF – Thermal test facilities for the validation of JUICE S/C components and large appendages;
- VEGA-E turbopump test bench (similitude cond.) - ESA (FLPP);
- PROBA 3 mission – entire set of MGSEs;
- Breadboard of Sealing and Closing System for a Phobos Sample Return mission – implemented under ESA's MREP2 programme;
- Development of centrifugal pump components using AM technology - ESA (GSTP);
- MESREF – CFRP backing structure for a solid reflector with metal mesh as the reflective surface - ESA (ARTES);
- HEMIS – Helicon Plasma Thruster - ESA (GSTP);
- GREENTH – Green thruster for attitude control and orbital manoeuvres of small satellites - ESA (GSTP);
- Pulsed Detonation Thruster - ESA (TDE);
- Feasibility and assessment of rotating detonation engines - ESA (TDE);
- Electro-pumps development for suborbital flight vehicles - ESA (GSTP);
- VERT – Working fluid versatile turbine design methodology research - ESA (Ro. Incentive Scheme);



## EQUIPMENT & LABORATORIES

- ISO 8 (60 sqm) and ISO 7 (40 sqm) cleanrooms
- Small TVAC -  $\Phi$  400 mm ( $-70^{\circ}\text{C} \div 180^{\circ}\text{C}$ , vacuum  $<1 \cdot 10^{-5}$ )
- Shock testing facility
- Hydraulic test bench for MPFL centrifugal pumps
- Turbopump test bench (by similitude with water and GN2)
- Small vibration shaker (2 kN) for testing small components and assemblies
- Soldering certification on ECSS-Q-ST-70-08 "Manual Soldering of High Reliability Electrical Connections"
- Metal 3D printing - SLM qualified 3D printing processes
- 3D inspections, NDT and mechanical-physical testing
- Technological development and mechanical equipment manufacturing (several CNC turning, milling and grinding machines)
- Composite material laboratory (incl. dedicated cleanroom and autoclave)
- Certifications: ISO 9001, ISO 140001, IEC 27001, ISO 45001



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# CDS

## CONTROL DATA SYSTEMS



### DESCRIPTION

Founded in 1994, Control Data Systems SRL (CDS) is a privately owned technology company based in Romania, a member state of ESA and the EU. CDS is a developer of communications products and technologies for extreme environments such as space.

One thing that sets CDS apart is the drive towards innovation and a recognition for the importance of R&D. CDS has performed extensive research in the space domain, having executed many R&D projects with ESA funding. In addition to cooperation with leading technical universities in Romania, CDS has prior experience working with some of the largest prime contractors in the European space industry.



### PRODUCTS & SERVICES

#### Space:

- UWB Node for intra-satellite communications
- SDR Inter Satellite Link
- Thermocouple Wireless Nodes for AIT
- Independent Software Verification and Validation (ISVV) services

#### Non space:

- Wireless nodes
- Routers and software for Safety and Automation Systems (SAS) in industrial environments
- Real Time Location Systems (RTLS)



### TECHNOLOGY

- TD 1 Onboard Data Systems (TRL 6)
- TD 6 RF Systems, Payloads and Technologies (TRL 4)
- TD 8 System Design & Verification





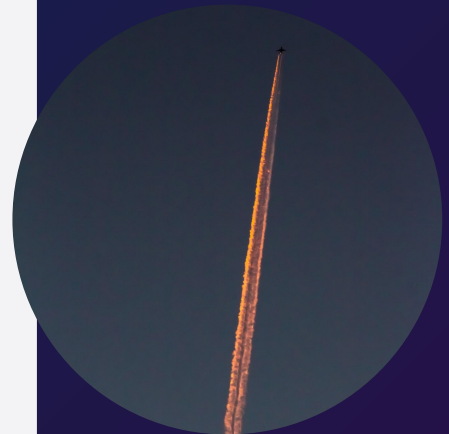
## PROJECTS AND REFERENCES

- WAIST - Wireless Applications to improve Satellite AIT Operations
- WiSAT - Wireless Communication Bus for Satellite Applications
- RT-UWB - Rad Tolerant UWB chip
- H-ISL - Hybrid Inter-Satellite Link
- Wizard - Wireless technology for launchers
- ISVV activities related to the VEGA E Navigation Equipment Software



## EQUIPMENT & LABORATORIES

- Various RF measurement equipment - spectrum analyzers and signal generators
- Controlled linear and circular movement rail for automated V&V activities
- Multiple SDR platforms
- Prototyping pick and place machine for SMD components
- Small reflow oven



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a Sopra Steria company

## CS GROUP ROMANIA




### DESCRIPTION

CS GROUP – ROMANIA is a member of CS GROUP (a subsidiary of SOPRA STERIA GROUP), integrated into the "Space Europe" Business Unit and specialized in software services and product development mainly for Space, Aeronautics, Energy, and IT sectors.



### PRODUCTS & SERVICES

Ground Segment:

-  **TECHNOLOGY**
- TD 2 Space System Software (TRL 8)
- TD 9 Mission Operation and Ground Data Systems (TRL 6)
- TD 10 Flight Dynamics and GNSS (TRL 8)
- TD 8 System Design & Verification (TRL 9)
- TD 26 Others (TRL 6)

- Support for Space Missions and EGSE, Navigation, Mission Control Centre, IT Support
- EO Data Processing Services for Agriculture - online services for agricultural products and practices, based on well established pillars Sen2-Agri and Sen4CAP systems
  - Continuous/on demand AOI monitoring for biophysical indicators (NDVI, LAI, fAPAR, fCover)
  - Gridded SAR backscatter and coherence time series for change detection
  - Cropland masks and crop maps (at regional or parcel level)
  - Agricultural practices, grassland mowing, burned and flooded area detection
- NEOSAT Flight Dynamics System - FDS modules designed to perform the orbital control of a geostationary satellite
  - Orbit determination based on antenna measurements and GNSS measurements, orbit propagation and orbit events computation of orbit ephemeris
  - Ground antenna pointing ephemeris
  - Collocation and survey of satellites supporting orbit propagation of external satellites equipped with electric, chemical or hybrid propulsion
  - Electric Station Keeping and Momentum Dumping computation, relocation and disposal maneuvers
  - Maneuver reconstruction and mass consumption computation
- TAO - Platform for integration, composition and cloud execution of data processing workflows
  - Dockerized EO toolbox integration: SNAP, Orfeo Toolbox, GDAL, EnMAP Toolbox / QGIS
  - Cluster execution: HPC, Kubernetes
  - OGC-compliant interfaces
  - Access to 300+ EO data collections



## PROJECTS AND REFERENCES

### Copernicus EOEP

- Sentinel-2 for Agriculture Monitoring (Sen2Agri)
- Science Toolbox Exploitation Portal 2.0 (STEP 2.0) & Sentinel-2 Toolbox
- SNAP Development & Maintenance - Optical Toolbox
- Sentinels for Common Agricultural Policy (Sen4CAP)
- Sentinels for Statistics (Sen4Stat)
- Agriculture Virtual Laboratory (AVL)
- EO4Africa R&D Facility and EO Africa DUNIA Service
- Information-as-a-Service Pathfinder – Sen4CAP

### Copernicus Space Component

- Reference System - publication, benchmark and indexing service for S1/S2/S3 processors
- Data Processors Re-engineering - Software Development Environment (SDE) and Core Processing Modules (CPM) for new generation S1/S2/S3 processors

### ARTES 14: NEOSAT

- NEOSAT Flight Dynamics Software - FDS for SpaceBus NEO.

### Scientific Missions

- Jupyter ICy moons Explorer (JUICE) Operations and Database Engineering Support Services
- Atmospheric Remote-sensing Infrared Exoplanet Large-survey (ARIEL) OPS & FDIR Support

### GNSS/EGNOS

- Monitor Ionospheric Network Extensions
- EGNOS V3 - Prediction Chain Facility (PCF) and Monitoring Control Interface Facility (MCIF)

### GSTP

- Tool Augmentation by User Enhancements and Orchestration (TAO) - software framework/platform for EO processing
- Cyber Safety and Security Operational Centre (CSOC)

### Horizon Europe / H2020

- SnapEarth - EarthSelf portal (self-service for infrastructure resources) and EarthAgriculture online EO processing service enRichMyData – enRichMyData Toolbox (integration and execution of semantic processing applications) based on the TAO Platform – acknowledged as “Key Innovator” by the EC.



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## DEIMOS SPACE



### DESCRIPTION

Deimos Space SRL is a Romanian company, part of the Indra group, that develops software and hardware solutions for the aerospace industry. Our main activities are in space areas such as mission analysis and navigation, atmospheric flight, GNC & AOCS, onboard software, functional verification and ground segment.

The company has a wide experience in the definition, implementation and operation of European space missions in several areas such as Earth observation, space transportation, science or exploration. Indra Deimos is among the very few entities with the know-how, expertise and economical power to endeavour in projects of high technological advancements and innovation, having developed and launched their own satellites, counting three so far: Deimos 1 (2009), Deimos 2 (2014) and Neptuno (2021).



### PRODUCTS & SERVICES

#### Flight Segment:

- GNC (Guidance, Navigation and Control) for launchers and atmospheric reentry vehicles
- GNC and AOCS (Attitude and Orbit Control System) for satellites
- Onboard Software for launchers and satellite platforms
- Checkout system for functional verification (including on-site laboratory)
- Customisable platform for ADCS of cubesats and microsats
- Mission analysis for atmospheric flight
- End of Life re-entry analysis

#### Ground Segment:

- End-to-End Performance Simulators
- Ground Data Processing

#### Space Situational Awareness:

- NEO (Near Earth Object) Tools
- Life Cycle Assessment



### TECHNOLOGY

- TD 2 Space System Software (TRL 7-9)
- TD 5 Space System Control (TRL 4-8)
- TD 11 Space Debris (TRL 6, 8-9)
- TD 9 Mission Operation and Ground Data Systems (TRL 6, 9)
- TD 10 Flight Dynamics and GNSS (TRL 5, 6, 8)
- TD 15 Mechanisms (TRL 4)
- TD 26 Others





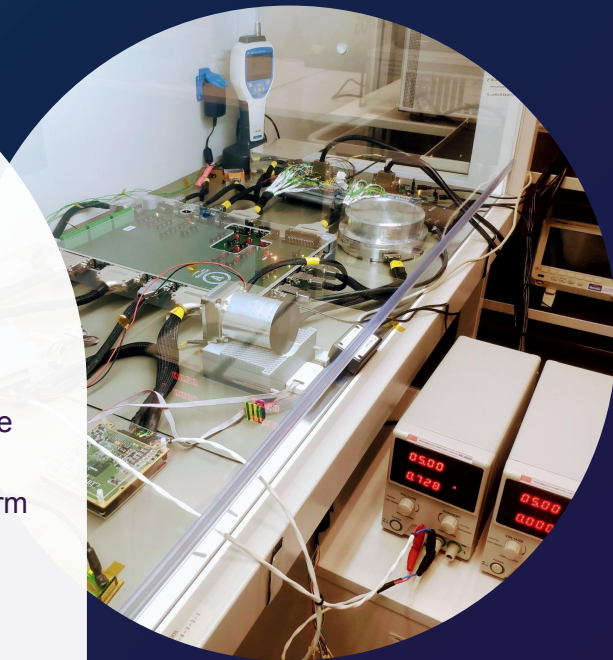
## PROJECTS AND REFERENCES

- REVLANGNC (GSTP) – GNC for atmospheric re-entry
- Space Rider - Guidance & Control for the Re-entry and TAEM phases + Drop Test Mission Analysis
- LISA – GNC/Control design
- SAT4EO (InCubed) - design, implementation and validation of the DVF facility for the AOCS product PIL and HIL validation
- E-ADCS - complete development of customisable satellite platform
- FLEX, CHIME, TRUTHS - EOL Re-entry analysis
- VEGA-C Hybrid Navigation – critical level B navigation SW
- Micro Launcher Demo and COGITAD with INCAS – Mission Analysis and GNC
- Vigil and TRUTHS – End to end simulator
- METOP, NGGM and BIOMASS – End to end simulator
- SAILOR - GS design
- SMOS - a new ground segment product SMOS FLARES
- NEOCC / Impact effect tool – operational tool to estimate the ground impact from asteroids
- NEOCC tools – back-end/front-end software
- Life Cycle Assessment – build and maintenance of the ESA LCA DB



## EQUIPMENT & LABORATORIES

- Deimos Space SRL is an engineering and software development company, certified ISO 9001, 27001 and 37001.
- Dedicated Laboratory for functional verification



## CONTACT

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## EMSIL TECHTRANS



### DESCRIPTION

Privately owned family business founded in 1995 with two business verticals:

1. Designing, manufacturing and selling custom made CNC machines for metalworking
2. Contract manufacturing of large steel fabrications with welding, precision machining and final assembly.

Emsil Group owns three manufacturing facilities in Romania:

1. HQ in Oradea for fabrication of CNC Machines & Steel Fabrications
2. Cluj-Napoca Plant for manufacturing Heavy Steel Fabrications
3. Aiud for manufacturing Steel Fabrications.



### PRODUCTS & SERVICES

Ground Segment:

Launcher specific Ground Segment, Ground Station – MGSE: MT Mechatronics GmbH project to manufacture EFF-Dock for Ariane 6 project. Emsil manufactured this alignment platform for the final integration (EFF, ESR Finishing Facility) of the P120 boosters on the launch site. The technical challenge of this EFF dock project was to position the 226-ton load of the booster with its pallets with a high precision before it was integrated with the central body of the launcher on the launch table.



### TECHNOLOGY

- TD 19 Propulsion (MGSE)



## PROJECTS AND REFERENCES

- Ariane 6 Launcher System Development - EFF-Dock



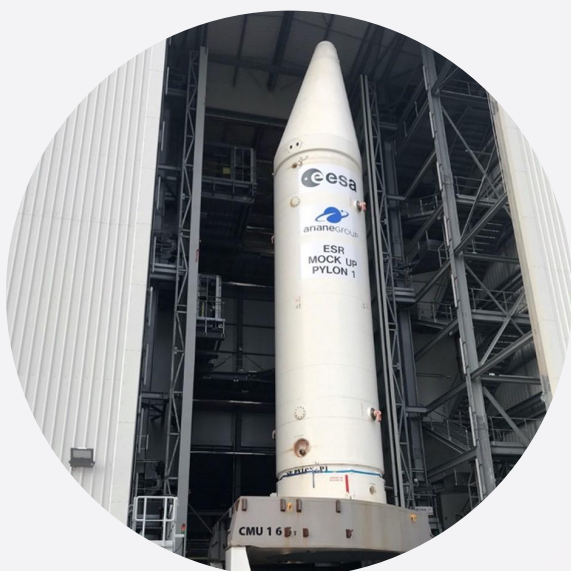
## EQUIPMENT & LABORATORIES

### Types of CNC Machines

- Horizontal Boring & Milling Machines
- Gantry Machines
- Deep Hole Drilling Machines
- Vertical & Horizontal Lathes
- Rotary Tables
- Retrofitting of Machines

Emsil is active in the following industries:

- Vacuum Technologies - Glass Coating Systems, Web Coaters, Chambers for PV applications
- Oil & Gas - Gas Turbine Baseplates, Chassis, Compressor & Exhaust Housings, Alternator & Motor Housings
- Naval - Ship cranes, Overflows, Actuators, Bottom Doors
- Aerospace - MGSE for aircraft
- Metallurgy - General Heavy Machinery Equipment



## CONTACT

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## EXCENT INGÉNIERIE ROUMANIE



### DESCRIPTION

Excent Ingénierie Roumanie, the local branch of the Excent Group - group of French origin, with an international presence - is specialized in engineering services, design, technical consultancy and business management in the industrial process.

Our expertise extends to various sectors of activity: Aeronautics/ Space, Automobiles, Naval, Railways, Energy.

The projects developed, integrating all the technical stages of Design, Conception, Process, Production Assistance and Training, owe their success to the quality of the services offered, cost optimization and the identification of technical variants with added value.



### PRODUCTS & SERVICES

#### Ground Segment

- MGSE for EUROSTAR NEOSAT project
- Transport containers

#### Non-space:

- Design work on aeronautics, railway and automotive
- Portable tools dedicated to aircrafts' equipment installation, removal and maintenance
- Handling tools for aircraft



### TECHNOLOGY

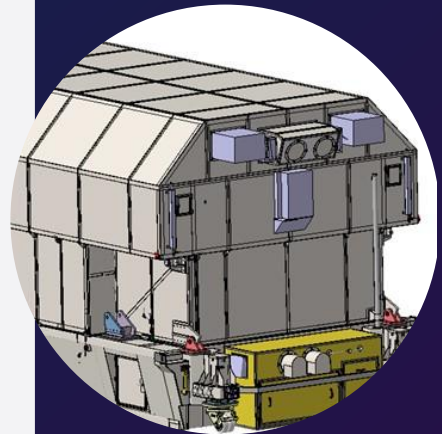
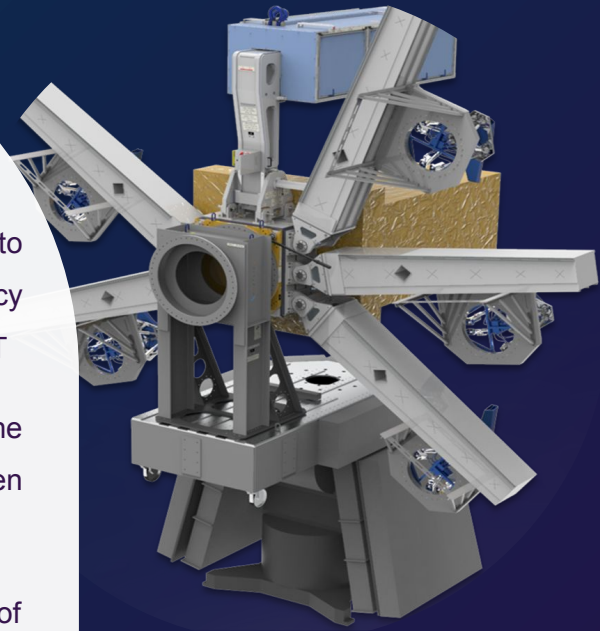
- TD8 System Design & Verification (MGSE)





## PROJECTS AND REFERENCES

- MIB/MIRES/Lifting Device - an assembly of 18 tools developed to handle and position the tools and satellite for radio frequency measurements in Near Field and Far Field. EUROSTAR NEOSAT
- Lifting tool for aerospace industry - a lifting tool that allows the handling of the spacecraft in the three configurations, between different positions. EUROSTAR NEOSAT
- Solar Array - a handling and interface tool for vibration testing of solar panels. EUROSTAR NEOSAT
- Horizontal Transport Container (called CTH05) project in work - used for transportation of the one spacecraft in horizontal configuration (Z Axis of Satellite parallel to the floor). The size and transported configuration required for this new version of the container cover the full range of the sizes of Eurostar Neo S/C family NEOSAT



## CONTACT

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## GMV INNOVATING SOLUTIONS



### DESCRIPTION

GMV Innovating Solutions (GMV Romania) was founded in 2009 and registered in Bucharest as a fully owned subsidiary in Romania of the international technology group GMV. GMV Romania follows the same structure model as of the rest of GMV Group, with an integrated operations schema benefiting from corporate services and simplifying the structure and management load while keeping the required independency to develop Romanian based activities and create relevant own expertise. The company develops in Romania the whole GMV portfolio of activities and performs its own projects with particular focus on Space industry. Benefiting from a consolidated growth, GMV Romania is today one of the Romanian leading private companies doing business with ESA, counting on significant lasting collaborations with the main players in the European Space market, in particular with the large satellite integrators and also the major institutional and commercial satellite operators.



### PRODUCTS & SERVICES

#### Flight segment

- Space Equipment and Avionics
  - HERA IPU - Image Processing Unit;
  - GMVision Instrument/Payload control unit;
  - GTheia+ camera; cameras incl. co-processors (navigation, space situational awareness, space exploration)
  - Custom Special Check-Out Equipment / Electrical Ground Support Equipment
- GNC & FDIR / Vision Based Navigation - Image processing;
- HW-SW codesign, FPGA implementation
- Onboard SW and ISVV

#### Ground segment

- *AutoCA*: Autonomous Collision Avoidance system
- *AutoSTM*: Space Traffic Management coordination platform
- *CreamPET*: Privacy enhancement techniques for SST and STM tools
- *gendared*: generic astrometric and photometric data reduction tool for SST applications



### TECHNOLOGY

- TD 5 Space Systems Control (TRL 7-8)
- TD 1 Onboard Data Systems (TRL 7-8)
- TD 11 Space Debris (TRL 6-7)
- TD 10 Flight Dynamics and GNSS (TRL 8)
- TD 2 Space Systems Software (TRL 7-8)
- TD 8 System Design & Verification (TRL 7)
- TD 20 Structures (TRL 5)

- SST NOC systems & operations: data processing services; orbit determination; sensor planner;
- *focussuite*: Flight Dynamics Systems (incl. OPEPOR: electric propulsion satellite platforms module);
- *flexplan web*: Mission planning system (as a Service);
- HAPS Integrated Satellite Control Centre (SCC4HAPS).

### User segment

- Riptide: Resilient PNT for Black Sea & Danube
- GNSS Signal integrity assessment; Interference and Multipath monitoring and effects estimation
- Remote sensing applications for waste monitoring, mining, forestry, urban green management



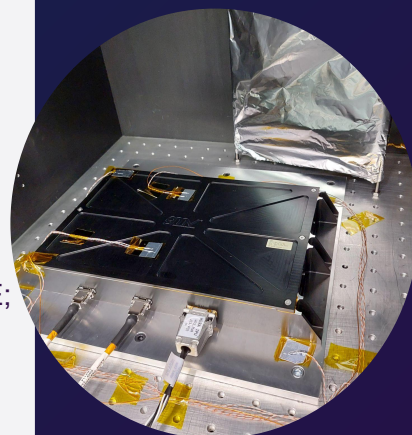
### PROJECTS AND REFERENCES

- HERA: GNC & FDIR; Image Processing Unit; GNC SCOE; Juventas cubesat: Mission Analysis & GNC
- Space Safety Program - CREAM -> Cream #1, #2, #3, #4; CreamPET; CREAM IoD; Autoca;
- Space Rider: Onboard SW; EGSE/SCOE (Data handling 1, Data handling 2, GNC)
- Exploration: Mars Sample Return Sample Transfer Arm VBDS EGSE; GMVision Image Processing Unit; MSR Delta Development - navigation camera; Camphorvnav: Engineering Model of the Vision-Based Navigation Camera for Phobos Sample Return; PilotB1+ Absolute Navigation vision based system development;
- Galileo 2nd Gen: Space Based Surveillance camera, G2G evolution of mission analysis tool (electric propulsion FDS implementation)
- Navigation: Resilient PNT - Riptide Phase 1 & 2 ; Margot; Perena
- Incubed: Mission Planning As A Service
- TDE: ESACCS: ESA Constellation Coordination System for ESOC; Race: Rendezvous Autonomous CubeSats Experiment Mission Phase A/B
- RO Industry Incentive Scheme - > Gendared; Mulcoba; NNVisNav; H-ISL; WISAT; DAFUS



### EQUIPMENT & LABORATORIES

- 1200 sqm full equipped office
- Space Avionics prototyping laboratory
- ISO 7/8 Clean Room
- Visos: Vision based navigation test bench
- GNSS monitoring station & GNSS signal simulator
- HW & SW development infrastructure (servers, virtual machines, specific tools, applications, IDE, etc.) + Dedicated data processing infrastructure
- CMMI Level 5 certificate



### CONTACT

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## GONZALES MECANICA DE PRECIZIE



### DESCRIPTION

Gonzales Mecanica de Precizie (GMP) was founded in 2005 in Floresti Prahova, Romania and is part of the French group GONZALES, group with a dynamic action in different industries, including the aerospace sector.

GMP is a company whose main object of activity is the manufacture of special machines, prototype, subassemblies, or spare parts for clients operating in sectors of activity with high constraints.

The experience, the know-how of our team, along with the internal production capacities, meet the exigencies of our clients for the realization of their projects.



### PRODUCTS & SERVICES

- Manufacturing of special machines, prototypes, tooling
- Design and construction studies (mechanical, electrical, automatic control, pneumatic and hydraulic systems)
- Welded carbon steel, stainless steel, and aluminium assemblies
- Machining of large-sized parts
- Automatic control systems and electrical wiring
- Painting and surface treatments
- Integration, assembly
- Platform testing in our workshops and Installation on customer sites
- Commissioning and assistance with production start-ups



### TECHNOLOGY

- TD 8 System Design & Verification (GSE)
- TD 26 Others





## PROJECTS AND REFERENCES

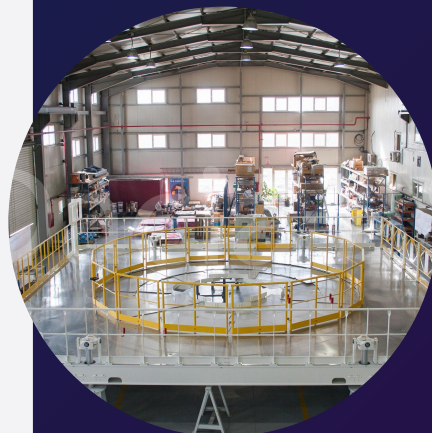
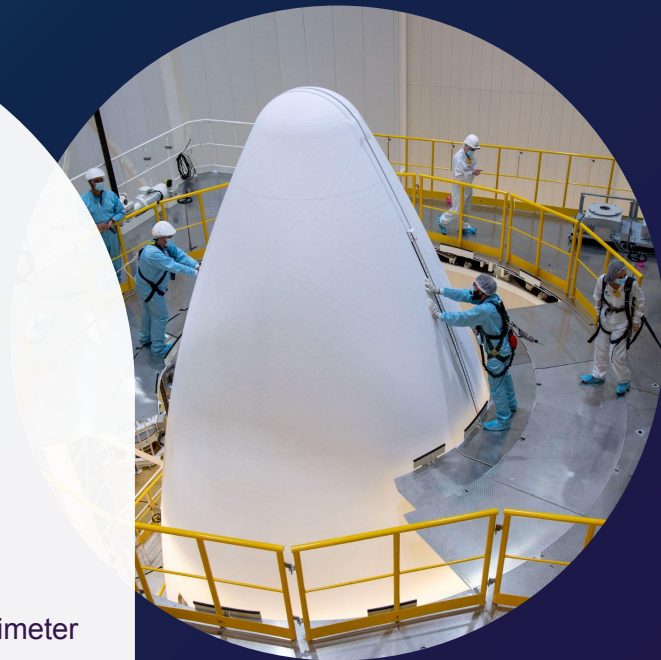
- Turning Trolley Neo/ 2017-2018
- Mobile Assembly Platform For Ariane 6 / 2019-2020
- Eurostar Neosat Reflector Frame E3000n / 2020



## EQUIPMENT & LABORATORIES

GMP is certified ISO 9001 and regarding the technical perimeter can manage the following:

- Making welded assemblies with machining (4+2 axis) on 5500 mm x 2400 mm x 2300 mm
- Performing parallel turning machining OD 350 mm / L 4000 mm
- Vertical turning machining (with milling head) OD 2200 mm / H 1350 mm
- 3D Control
- Blasting and liquid painting 7000 mm x 4000 mm x 4000 mm, + other corrosion protection
- Assembly, electrical and pneumatic wiring, programming



## CONTACT

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High Performance Structures  
Inovatie si Dezvoltare S.R.L.  
ROMANIA

## HPS ROMANIA



### DESCRIPTION

The portfolio HPS Romania offers to institutional and commercial customers from the international space community includes Reflector Antennas, lightweight structures made out of metal, Optical Solar Reflectors (OSR) glued onto radiators, Multi Layer Insulation (MLI), Copper and Graphene Thermal Straps, MGSE, Purge Equipment, engineering & assembly services.



### TECHNOLOGY

- TD 7 Electromagnetic Technologies and Techniques (TRL 4-9)
- TD 20 Structures (TRL 4-9)
- TD 21 Thermal (TRL 4-9)
- TD 24 Materials and Processes (TRL 4-9)
- TD 6 RF Systems, Payloads and Technologies (TRL 3-4)



### PRODUCTS & SERVICES

#### Flight Segment:

- Ultra-High Frequency helix antenna for cubesats (UDAN)
- Metallic Reflectors (aluminum, titanium) for HERA
- Mesh Reflectors (MESREF)
- Passive de-orbiting system (ADEO-N)
- Multi-Layer Insulation (PROBA-3 & ALTIUS)
- Radiators (SENTINEL 4)
- Flexible Thermal Straps
- Thermal Insulation Washers
- Metallic secondary structures (I-HAB & Copernicus CIMR)

#### Ground Segment:

- MGSE - Vertical Integration Stands - BIOMASS (for Airbus UK), METImage (Airbus Germany) Multi-Purpose Adapters – METImage; Thermal Vacuum Adapters – METImage; Lifting Devices – METImage & Copernicus CHIME; Instrument Turning Table - high precision, vacuum compatible – METImage; Instrument Alignment Table – METImage; Antenna Testing MGSE - for HPS-DE; Transport Containers and Transport Frames - HPS-DE (ESA development of a Large Deployable Reflector); Propulsion Systems for Copernicus LSTM & CRISTAL.
- Purging Ground Support Equipment (JUICE & ALTIUS)



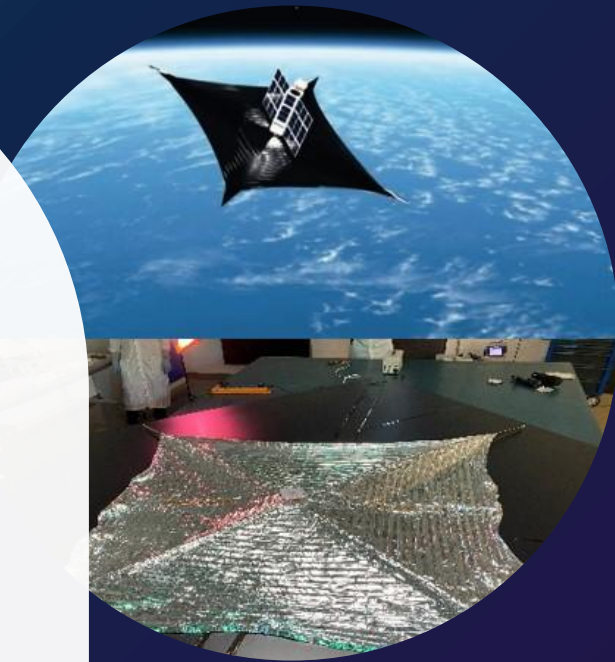
## PROJECTS AND REFERENCES

- Gateway I-HAB - Internal Secondary Structure
- Copernicus CHIME - Lifting Frames
- Copernicus CRISTAL - Propulsion System Structures
- Copernicus LSTM - Propulsion System Structures
- Copernicus CIMR - Large Deployable Reflector Subsystem
- Altius - MLI for Instrument
- CLIM (CO2M) - MLI for Instrument
- HIVE - FM MLI
- HERA - High Gain Antenna
- Proba3 - MLI for optical bench assembly; Heaters & Sensors
- BIOMASS - MGSE AIT Stand
- Sentinel 4 (MTG-S) - Radiator for UVN instrument
- METOP - MGSE for MetImage
- JUICE - Satellite Purge Equipment
- ADEO-N2 - Mechanical Parts



## EQUIPMENT & LABORATORIES

- Integration Hall
- Clean room ISO8
- Laboratory
- ISO EN 9100:2018 Certificate



## CONTACT

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## ICPE ELECTRIC MOTORS



### TECHNOLOGY

- TD 15 Mechanisms (TRL 5)
- TD 20 Structures (TRL4)
- TD 10 Flight Dynamics and GNSS (TRL 4)



### DESCRIPTION

Romanian company, developer of special electric machines (brushless servomotors, actuators, torque motors etc.), servo-systems, special electrical cables, electrical apparatus.



### PRODUCTS & SERVICES

Flight Segment:

- Stepper Motors
- Limited Angle Torque Motors
- Brushless Motors
- Reaction Wheels
- Metallic Structures developed using Advanced Manufacturing

Non-space:

- Special electric motors – Brushed Torque Motors, Brushless Torque Motors, LAT DC Brushless Motors, Servo Motors, Synchronous Permanent Magnet Motors, Frameless Motor, Outer Rotor Motors, Electric Motors for Cryogenic and Vacuum, Precision Motors, Electric Generators, Resolvers, Microsyns, Linear Motors, Gyros, electronically assisted rate gyro sensors, reaction wheels and other inertial navigation systems.





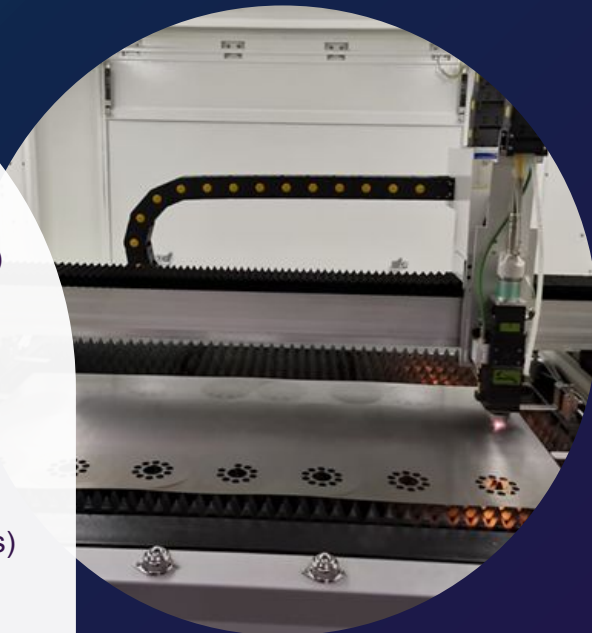
## PROJECTS AND REFERENCES

- Electric Motor Spin Into Space (Mechanisms)
- Stepper Motor for Multimedia Antenna Deployment (Mechanisms)
- Limited Angle Torque Motors for LLTVAS System of the Ariane 6 (Launchers)
- DC Brushless Motor For Actuation System (Launchers)
- Reaction Wheel - Development of a new reaction wheel using up to date technology (Mechanisms)
- Electric Motor For New Orbital Infrastructure Pumps System
- Synchronous Motors for LEO and GEO applications (Mechanisms)
- Printed Component for New Orbital Infrastructure Pumps System
- Derisk - Project SM2QM (Mechanisms)



## EQUIPMENT & LABORATORIES

- Vacuum chamber (Pumps: ion pump, turbopump and diaphragm pump; Vacuum level of up to  $10^{-6}$  mbar - Internal dimensions 16" x 16" x 16"; Customized feedthroughs: high power and monitored/measured), Feedthrough for additional cooling system.
- System for testing and measuring the temperatures in the range  $-100^{\circ}\text{C}/+180^{\circ}\text{C}$  and the functional parameters for electric motors used in aerospace / space applications.
- Coordinate measuring machines type Wenzel XOrbit 55 (ensure complex measurements with accuracy up to  $0.1\text{ }\mu\text{m}$ )
- Steppers test benches
- Synchronous brushless motor test bench
- Limited angle torque motors test bench
- Platform for micro-vibrations measurement based on high-sensitivity accelerometers (indirect method for measuring micro-vibrations)
- Platform for rotational speed measurement with high accuracy
- Platform for bearing friction torque and cogging torque measurements
- CNC Manufacturing equipments: Milling, Drilling, Grinding, Laser cutting, Laser welding, Electrical discharge machining
- OPERATOR (CAT. 3) according to ECSS-Q-ST-70-61 Through Hole Technology (ECSS-Q-ST-70-08)
- OPERATOR (CAT. 3) according to ECSS-Q-ST-70-61 Wires and Terminals (ECSS-Q-ST-70-08)
- IPC/WHMA-A-620 - Requirements and Acceptance for Cable and Wire Harness Assemblies
- Certificates for European Adhesive Bonder - International Adhesive Bonder.



## CONTACT

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## NATIONAL INSTITUTE FOR RESEARCH AND DEVELOPMENT IN MICROTECHNOLOGIES



### DESCRIPTION

IMT Bucharest is one of the main Romanian R&D organizations specialized in micro-nano-bio-technologies and nano-electronics. The main research fields are in close connection to four key enabling technologies: micro-nanoelectronics, photonics, nanotechnology, and advanced materials. IMT is integrating R&D with education and support for industry (services, technology transfer).

IMT has participated in more than 50 European projects (FP6, FP7, H2020, Horizon Europe) and several ESA projects, earning its recognition in various multidisciplinary consortia and networks.

IMT offers a collaborative environment, displaying a broad range of experimental and computing resources for micro and nanotechnologies, from simulation and design techniques, to characterization tools, processing and testing equipment. Most of these resources are grouped in the IMT Research Infrastructure: IMT-MINAFAB (Centre for Micro- and NAnoFABrication, [www.imt.ro/MINAFAB](http://www.imt.ro/MINAFAB)) and CENASIC (Research Centre for Integrated Systems Nanotechnologies and Carbon Based Nanomaterials).



### SERVICES

- UV Photolithography (including maskless, double-sided wafer alignment and exposure)
- Nanolithography (EBL, EBID, EBIE, Dip-pen) and SEM
- Thin film deposition in high-vacuum
- Chemical vapor depositions and thermal processing (PECVD-LPX-CVD; LPCVD; RTP)
- Precision etching of materials (plasma assisted and wet etching, shallow and deep) and X-Ray diffractometry
- Scanning probe microscopy: AFM, STM, SNOM, confocal, Raman mapping
- Nanomechanical characterization and Microarray spotting/scanning
- Analytical characterization tools;
- Interferometry/profilometry; Spectroscopy;
- Electrical characterization



### TECHNOLOGY

- TD 17 Optoelectronics (TRL 7)
- TD 7 Electromagnetic Technologies and Techniques (TRL 5)
- TD 6 RF Subsystems, Payloads and Technologies (TRL 3-4)



## PROJECTS AND REFERENCES

- Microwave filters based on GaN/Si SAW resonators, operating at frequencies above 5GHz, ESA Contract No. 4000115202/15/NL/Cbi, 2015- 2017
- 0-level encapsulation of reliable MEMS switch structures for RF applications, ESA Contract No. 4000110819/14/NL/CBi, 2014-2017
- PROBA-3 Coronagraph System FQ/3-13899/13/NL/GLC, IMT subcontractor for CSL and responsible for the Occulter Position Sensor Emitters Heads
- Atypical reliability tests, ESA Contract No IPL-PTS-CBI-L-2015-944



## EQUIPMENT & LABORATORIES

IMT is part of the Engage in the European Research and Technology System (EERTS) - <https://eertis.eu/erio-2200-000u-4306>, through its Facility for Design, Simulation, Micro- and NANO FABrication of electronic devices and systems (IMT-MINAFAB) - <https://eertis.eu/errf-2200-000f-0676>, with four centers:

- MIMOMEMS: Research Centre of Excellence “Micro and Nanosystems for Radiofrequency and Photonics”
  - Micro-Nano Photonics Laboratory (L3)
  - Micromachined Structures, Microwave Circuits and Devices Laboratory (RF-MEMS) (L4)
- CNT-IMT: Centre of Nanotechnologies
  - Laboratory of Nanobiotechnology (L1)
  - Nano-Scale Structuring and Characterization (L6)
  - Molecular Nanotechnology Laboratory (L9)
- CINTech: Research Centre for Integration of Technologies
  - Microsystems in Biomedical and Environmental Applications Laboratory (L2)
  - Ambient Technology Laboratory (L8)
  - Laboratory for Micro and Nano Fluidics (L10)
- CENASIC: Research Centre for Nanotechnologies and Carbon-based Nanomaterials
  - Simulation, Modelling and Computer-Aided Design Laboratory (L2)
  - Reliability laboratory (L5)
  - Laboratory for Carbon Based Nanotechnologies and Nanostructures (L11)

*Optical photos of the MEMS structures after encapsulation*

*Hermetically packaged filter, integrated on a dedicated fixture*



## CONTACT

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## NATIONAL INSTITUTE FOR AEROSPACE RESEARCH "ELIE CARAFOLI"



### DESCRIPTION

Leading aerospace research establishment in Romania, previously proven leadership role in both European and International projects. It has experience in multi-disciplinary developments with the capability to undertake activities from TRL 1 to TRL 8. INCAS is part of international organizations ranging from technical advisory boards to also more strategic roles and contributions in the European research establishment groups such as the ESRE. INCAS has been involved in all Romanian research and innovation programs and has always contributed to the national and international forums and groups that lead the policy pathway in the R&I agendas.



### PRODUCTS & SERVICES

#### Flight Segment

- Mechanical design for space transportation systems
- Structural analysis and optimization for space structures
- Guidance, Navigation and Control for space transportation systems
- CFD simulations
- Embedded software development
- Space flight dynamics and simulation
- Space Systems Engineering

#### Ground Segment

- Ground testing facilities (in-flight testing and validation facilities)
- Măneciu Experimental Base
- Hardware in the loop and Real-Time testing and validation capabilities
- Avionics Laboratory
- Propulsion test benches



### TECHNOLOGY

- TD 8 System Design and Verification (TRL 6)
- TD 20 Structures (TRL 9)
- TD 5 Space Systems Control (TRL 6)
- TD 18 Aerothermodynamics (TRL 6)
- TD 9 Mission Operation and Ground Data Systems (TRL 3-4)
- TD 11 Space Debris (TRL 3-4)
- TD 14 Life and Physical Sciences (TRL 3-4)
- TD 19 Propulsion (TRL 6)
- TD 10 Flight Dynamics and GNSS (TRL 6)





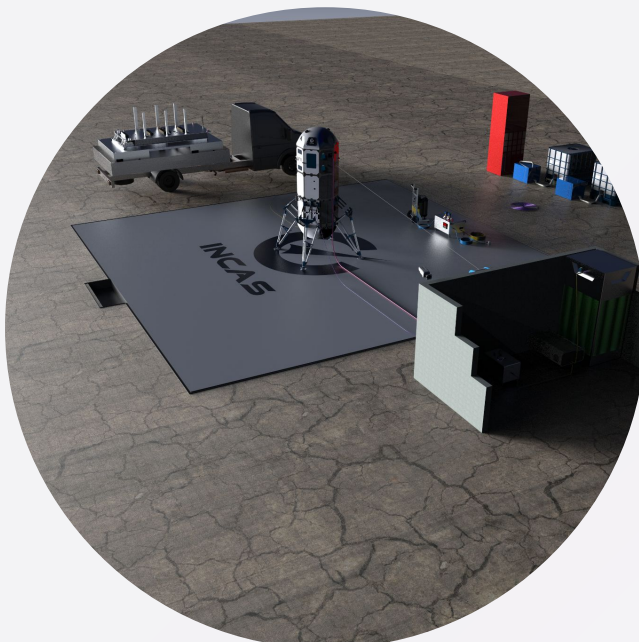
## PROJECTS AND REFERENCES

- Microlauncher Study (Prime) (FLPP)
- Detailed Design and Technology Maturation for Microlauncher Demonstrator (Prime) - (FLPP)
- Demonstrator for Technologies Validation (DTV) (Prime) (FLPP)
- Deorbitation Design to Demise (Prime) (FLPP)
- Demise Observation Capsule (DOC)
- Euclid Mission - Mechanical Structures
- Deorbitation Design to Demise Aero-thermodynamics analysis (FLPP)
- ADAMP Development (Prime) (GSTP)
- Small Innovative Launcher for Europe (SMILE) - H2020, European Commission
- Reusable strategic space launcher technologies & operations (SALTO) - Horizon Europe, European Commission



## EQUIPMENT & LABORATORIES

- Wind tunnel capabilities - Subsonic, Supersonic and Hypersonic wind tunnel facilities
- Chemical propulsion test bench
- Propellant storage
- Training Simulators
- Orbital Space Systems Laboratory



## CONTACT

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## NATIONAL INSTITUTE FOR LASER, PLASMA AND RADIATION PHYSICS



### DESCRIPTION

The National Institute for Laser, Plasma & Radiation Physics, with its current structure encompassing research in laser physics and applications, solid-state quantum electronics, and plasma and electron accelerators, is the result of 60 years of organization and reorganization in the field of physics research.

Researchers and administrative staff at the institute are engaged in cutting-edge research spanning a wide spectrum, from basic photonic materials and high-power lasers, nanomaterials and nanotechnologies, quantum dots and information technologies, to advanced applications in plasma physics, X-ray microtomography, industrial photonics, biophotonics, and plasma coatings. Their activities also include participation in various ESA projects.

INFLPR is currently a member of the EURATOM association, a partner in the Extreme Light Infrastructure (ELI), LASERLAB EUROPE, ALICE, and plays a central role in numerous projects funded by the EU, NATO, and other international organizations.



### PRODUCTS & SERVICES

- Coated components for improved properties: lubrication, scratch resistance, hardness, high heat resistance, chemical corrosion, optical reflection, electromagnetic shielding
- Coated components for medical, mechanical, optical, high heat turbine, engine applications
- Coatings of different materials working in harsh environments at industrial standards of 8" wafers
- Dedicated plasma coating devices for improved properties of components, integrated with existing fabrication facilities
- Design and realization of dust cleaning systems
- Design and realization of oxygen generation system
- Electrical characterizations with temperature 6K-600K
- Material Testing for Radiation Resistance
- Optical characterization: interferometry, spectroscopy, ellipsometry
- Physical and chemical properties characterization systems: SEM-EDX, HR-TEM, XPS AFM, X-Ray diffractometry
- Tailor made plasma-based coating devices to be integrated within production facilities
- Technology for oxygen/metals production using laser ablation of Moon's Regolith material
- Tribological characterization at nanoscale



### TECHNOLOGY

- TD 4 Space Environment and Effects (TRL1)
- TD 16 Optics (TRL5)
- TD 14 Life and Physical Sciences (TRL2)
- TD 24 Materials and Processes (TRL 6)



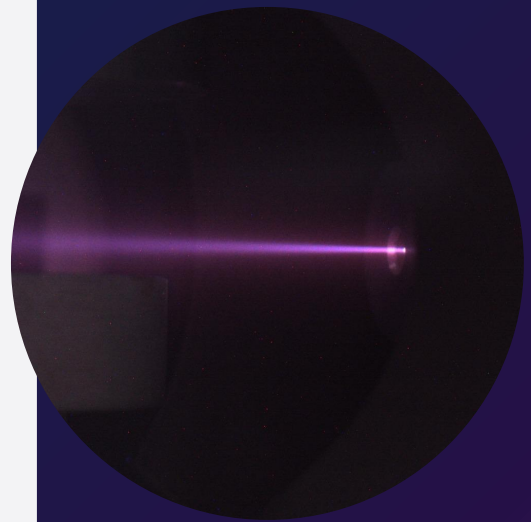
## PROJECTS AND REFERENCES

- ATHENA: Diamond Coating device – Large-scale coating device for integration into fabrication facility of the telescope mirror
- DropCoal – Microgravity research project on droplet coalescence, including system and software development (Parabolic Flight Campaign), and two missions: DropCoal 1 on the ISS and DropCoal 2 on the NYX capsule, focused on scientific requirements and data analysis.
- DropTES 2018 - interaction of laser exposed medicine droplets with target surfaces under microgravity conditions at the Drop Tower
- EMI – Electromagnetic shielding coating on flexible & solid surfaces
- HyperMed – study of the influence of hypergravity on the interaction of medicine solutions at the Large Diameter Centrifuge
- LAMOR - Laser Assisted mining of Oxygen from Regolith”
- Open Discovery Ideas Channel I-2023-07333: Coaxial plasma gun as a multitool for future Martian missions
- Open Discovery Ideas Channel I-2023-07746: Energetic pulsed electron beam pencil, a unique tool for dust removal in space environments
- REFRACTORY – High heat resistant coatings based on refractory metals
- Strengthening Nuclear Fusion Research in Romania / SNFR-RO
- Technology for Removing Dust on Mars Missions: A collaboration with the Romanian Space Agency (ROSA), TRIBOVAC – Lubrication coatings working under high vacuum



## EQUIPMENT & LABORATORIES

- Clean room ISO 6-7
- Coaxial plasma gun and Dust cleaning equipment
- Cryosystems for electrical characterizations with temperature 6K-600K
- Electron beam accelerator 6 MeV and Electron gun 10-15 keV
- Large-scale plasma-based facilities for coating flexible and solid surfaces
- Laser ablation systems for coatings at industrial standards of 8” wafers
- Nano Triboindenter and Oxygen generation equipment
- Physical and chemical characterization systems: SEM-EDX, HR-TEM, XPS AFM
- Surface analytical tools for composition and film thickness at nanometric scale
- X-Ray diffractometry



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## NATIONAL INSTITUTE OF RESEARCH AND DEVELOPMENT FOR OPTOELECTRONICS



### DESCRIPTION

INOE is a National R&D institute which develops fundamental and applied research in the field of optoelectronics, based on the interaction processes of the optical field with matter, in conjunction with the development of complementary methods in the field of analytical chemistry and high pressure physics.

The Remote sensing department has a consolidated local expertise within 10 years of space activities, using facilities and dedicated equipment. They are in a long term partnership with ground based international networks (PANDONIA, ACTRIS, AERONET), have calibration facilities for LIDAR-Light Detection and Ranging for atmospheric aerosols (unique in Romania) and expertise in training (<https://environment.inoe.ro/>).



### PRODUCTS & SERVICES

Ground Segment:

- Calibration/validation activities related to Earth Observation satellites
- Development of prototypes of optical instruments to be proposed for future projects
- Development of algorithms for validation and exploitation for atmospheric parameters, measured by satellites



### TECHNOLOGY

- TD 2 Space System Software (TRL 1-3)
- TD 8 System Design and Verification (TRL 1-4)
- TD 12 Ground Station System and Networks (TRL 1-5)
- TD 16 Optics (Optical equipment and instrument technology) (TRL 1-5)
- TD 17 Optoelectronics (laser technologies) (TRL 1-5)





## PROJECTS AND REFERENCES

- MULTIPLY - Development of a European HSRL Airborne Facility
- DIVA - Demonstration of an Integrated Approach for the Validation and Exploitation of Atmospheric Missions
- NATALI - Neural Network Aerosol Typing Algorithm Based On Lidar Data <https://natali.inoe.ro/>
- RAMOS - Technical Assistance For A Romanian Atmospheric Mobile Observation System
- GSP 2016 Alcantara Initiative: International RD Studies 2015 Assessment Of Atmospheric Optical Properties during Biomass Burning Events and Long Range Transport of Desert Dust
- HERA Implementation Phase B2S2/C/D/E1
- FRM4RADAR - 94 GHz Miniature Network for Earthcare Reference Measurements <https://geomat.uni-koeln.de/forschung/frm4radar>
- AROMAT - Technical Assistance for Airborne Romanian Measurements of Aerosols and Trace Gases <https://uv-vis.aeronomie.be/news/20141205/>
- SAMIRA - Improved Air Quality Monitoring/Forecasting for Eastern European Countries and Norway
- QA4EO - Field Atmospheric Composition Uncertainty Field Studies
- SVANTE - Sentinel 5p Validation and Calibration Experiment <https://s5pcampaigns.aeronomie.be/index.php/campaigns/s5pval-ro>



## EQUIPMENT & LABORATORIES

- Aerosol Remote Sensing Laboratory, including optical laboratory and lidar calibration facilities within ACTRIS infrastructure
- Aerosol In-Situ Laboratory
- Cloud Remote Sensing Center
- Greenhouse Gases Laboratory



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## INSTITUTE OF SPACE SCIENCE



### DESCRIPTION

The Institute of Space Science - INFLPR Subsidiary (ISS), conducts advanced scientific research in astroparticle physics, high-energy physics, astrophysics and cosmology, and space plasma physics, alongside applied research and the design and development of space technologies. ISS is actively engaged in prestigious national and international collaborations, including major terrestrial experiments at CERN and FAIR-GSI, as well as participation in large scientific collaborations such as KM3NeT and the Pierre Auger Observatory. ISS contributes to ESA and NASA space programs through missions such as Euclid, LISA, CLUSTER, SWARM, SMILE, THEMIS, and MMS.



### PRODUCTS & SERVICES

#### Flight Segment

- On-board software
- Design requirements for science missions
- On-board instrumentation

#### Ground Segment

- Development of prototypes of optical instruments to be proposed for future projects
- Development of algorithms for validation and exploitation for future satellite missions
- Science mission data analysis
- SST
- SSA
- AIT
- Mission definition and analysis
- Pipeline development
- QA/PA activities
- Computer centers for space missions



### TECHNOLOGY

- TD 2 Space System Software (TRL 1-3)
- TD 8 System Design & Verification (TRL 1-4)
- TD 12 Ground Station Systems and Networks (TRL 1-5)
- TD 16 Optics (Optical Equipment and Instrument Technology) (TRL 1-5)
- TD 17 Optoelectronics (Laser Technologies) (TRL 1-5)



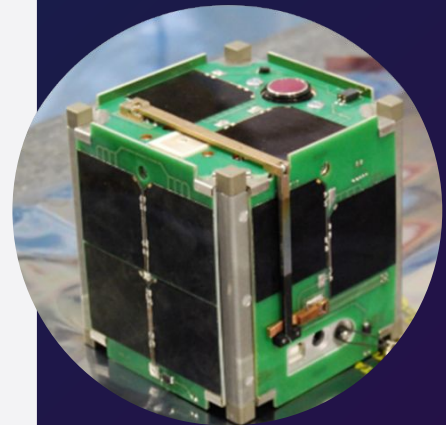
## PROJECTS AND REFERENCES

- ESA - LISA Advanced Cas Sensor Development
- ESA - LISA Data Pipelines For Lisa Mission
- ESA - SMILE Modelling And Numerical Simulations For Magnetospheric Interfaces And Magnetosheath Jets Of Near-Earth Plasma
- ESA - CLUSTER, a mission formed by four satellites on Earth's orbit to study its magnetosphere
- ESA - Euclid, the space telescope that will study the primordial Universe by observing galaxies and galaxy clusters in the visible and infrared spectra
- ESA - Planck, the first ESA mission to study the origin of the Universe
- ESA - PTW, a project coordinated by ISS whose goal was to develop a portable telemedicine workstation
- ESA - SWARM, a mission of three satellites that will study the near-Earth magnetic field
- NASA/ESA - CFS-A, the first Romanian experiment on the International Space Station
- NASA - FAST, a mission that provided key measurements enabling researchers to study the aurora borealis.



## EQUIPMENT & LABORATORIES

- ISO 8 (120 sqm) and ISO 5 (20 sqm) clean rooms ECSS-Q-ST-70-01C
- V850-440-LPT600-SPA-16K vibration shaker (11.5 kN) for testing components
- TVAC, 1e-7 mbar working pressure, -85 degrees C to 170 degrees C temperature range, 500 mm diameter x 800 mm length internal volume
- CNC milling machine
- QUANTEC (Quantum Communication Center)
- Computing GRID Infrastructure



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## LASTING SOFTWARE



### DESCRIPTION

LASTING Software is redefining industry standards by developing products, services & consultancy that fill in the gap between terrestrial and satellite communications. We build an ecosystem, products & solutions for the integration of 5G and non-terrestrial networks.

As of 2021, we started investing in the development of our own 5G non-terrestrial testbed with direct access, co-funded by the European Space Agency. The goal is to provide an affordable and flexible 5G NTN product that allows the prototyping and validation of complex quality of experience scenarios in a broad range of industries.

In 2023 Lasting Software was given the ESA Rising Star award for our rapid progress in the field of 5G non-terrestrial research and development.



### PRODUCTS & SERVICES

#### Ground Segment:

- Services - satellite backhauling integration & prototyping
- Products
  - CELEOS: multi-orbit satellite channel emulator
  - FLEX-SPACE: 5G NTN-in-a-box
  - ARTES HUB ROMANIA

#### Non space related:

- Product - on-prem video conferencing solution



### TECHNOLOGY

- TD 6 RF Systems, Payloads and Technologies (TRL 3)
- TD 12 Ground Station System and Networks (TRL 5)





## PROJECTS AND REFERENCES

- One major ESA funded project ongoing for the system validation of next generation iDirect HUB together with a Nokia 5G infrastructure that enable MEO satellite usage with continue service (enable by Make-Before-Break handover capabilities)
- Development of a multi-orbit channel emulator using SDR technologies, as part of company's 5G NTN end-to-end testbed
- Development of a satcom Hub for the use of non-satcom industry use-case prototyping
- Awarded one of the ESA Rising Star SMEs in 2023
- PatriotFest award for Space segment in 2024



## EQUIPMENT & LABORATORIES

- Cellular Backhauling Laboratory
- 5G NTN direct-to-device test bed



## CONTACT

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## PRO OPTICA



### DESCRIPTION

Pro Optica is the leader of the Romanian Defense & Security optronic based solutions Market and a player in the International Market. We are active since 1936 and became a private company in 2001. Romanian and worldwide Customers are using, day and night, in real operational missions, our:

- more than 2000 Night Vision Devices for Infantry,
- driver, commander, gunner and protection solutions for more than 358 Armored Vehicles,
- 250 Intelligence, Surveillance, Target Acquisition and Reconnaissance (ISTAR) systems.

Currently, Pro Optica holds 14 Patents, designs and registered trademarks. The company is certified with EN ISO 9001:2015, EN ISO 14001:2015, NATO AQAP 2110, NATO code: NCAGE 006YL OMCAS 9/2022.



### PRODUCTS & SERVICES

#### PRODUCTS

##### ISTAR:

- ARTEMIS Medium Range;
- SIOBLIN LR/BT;
- ARTEMIS Long Range.

##### Armoured Vehicles:

- Gunner ANUBIS;
- Commander SIOBLIN LR/MR;
- Driver CONDOR SR/SRD.

##### Multisensors:

- CONDOR MRD;
- CONDOR LRD;
- CONDOR VLR;
- CONDOR VLRD.

#### SERVICES

- Mechanical design and manufacturing;
- Electronic design and manufacturing;
- Electrical design and manufacturing;
- Development of dedicated software for each individual application.



### TECHNOLOGY

- TD 16 Optics (Optical system engineering) (TRL 4-8)
- TD 26 Others



## PROJECTS AND REFERENCES

- ESA/ESTEC, Preparatory Activity for the Design, Manufacturing and Testing of Laser Retro-Reflectors.
- ESA, Technological development and qualification tests assurance in order to achieve CCRR assemblies, suitable for the Galileo satellites.
- NEOSTEL, P2-NEO-V NEO Survey Telescope Detailed Design.
- NEOSTED, P2-NEO-X NEO Survey Telescope Procurement, Development and Acceptance of Full-Scale Integrated Prototype.
- ESA, LISA CAS Engineering Model Development.



## EQUIPMENT & LABORATORIES

### TESTING:

- Environmental laboratory (rain, dust, low & high temperature);
- Mechanical shaker;
- EMI-EMC (under construction).

### LABORATORY:

- Optical measurement laboratory.

### MECHANICAL MANUFACTURING:

- CNC machines;
- Sandblasting;
- Welding;
- Painting.



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## RARTEL



### DESCRIPTION

RARTEL is a Romanian Italian joint venture specialized in satellite services and applications. Since 1998 RARTEL has been providing products and services within Romania and its neighbouring countries, building on its shareholders' wide ranging portfolio.

The shareholders are Telespazio S.p.A (62%), a Leonardo / Thales company and the National Company of Radiocommunications S.A. (Radiocom, 38%), a company fully owned by the Romanian Ministry of Communications. Being under the control of Telespazio, RARTEL is an integral part of the Space Alliance, i.e. one of the two main European Primes for satellite manufacturing.

The company's mission is to supply Romanian and international customers services and solutions related to the use of satellite technology.



### PRODUCTS & SERVICES

Tracking, telemetry and control services from its facility in Cheia Space Center - Prahova County, Romania:

- The station, provided with a 9 m antenna, uses S band (2-3 GHz) and is the only installation of its kind in Eastern Europe. The station is used for control of the several European satellites.
- RARTEL implemented a Third Generation TT&C antenna and the related long term operational. This is based on a 8m S-Band antenna and is providing telemetry, tracking and ranging services.
- RARTEL has relocated from Germany a second generation MTG system in 2018. This is based on a pair of 13m dual band (S-Band and L-band) antennas capable of supporting telemetry, tracking and ranging services as well as satellite image processing.
- RARTEL implemented a satellite telecommunication Gateway, hosting a 9m Ka-Band antenna. It will serve as a satellite internet gateway.



### TECHNOLOGY

- TD 12 Ground Station System and Networks (TRL 8-9)
- TD 5 Space System Control (TRL 9)
- TD 2 Space System Software (TRL 9)
- TD 6 RF Systems, Payloads and Technologies (TRL 9)
- TD 25 Quality, Dependability and Safety (TRL 8)
- TD 11 Space Debris (TRL 8)





## PROJECTS AND REFERENCES

- Implementation of a tracking radar for LEO objects using an infrastructure of two 32 meter Standard A dish antennas which were modified to work for SST purposes.
- Preparatory activities for the possible participation of Romania in the GovSatCom Precursor programme.
- Development of a software package aimed at scheduling in an optimized way the utilization of a population of ground stations, however distributed, for Telemetry applications or for data reception.
- Within the Copernicus related activities, RARTEL team aims to facilitate the population and archiving of Earth Observation data supplied by the Data Providers who contribute to the Copernicus programme.
- Developing and testing of software components within European Ground Segment-Common Core programme. The objective of the work was to perform the detailed SW design, implementation, integration, verification and validation.
- Refurbishment and upgrade of the system DAC "Centralized Alarm System" of the Guiana Space Center (CSG).
- Refurbishment of the Cinetelescope in l'Île Royale (CSG) used for launchers tracking by performing the design and provision of a precise monitoring and control system for servomechanisms, servitudes and dome.
- Ground components for Space Rider program. RARTEL is in charge of design, procurement, engineering and implementation, tests and warranty for these components.
- Installation of 7 antennas in 7 different locations within Romanian territory to be used for better meteorological predictions.



## EQUIPMENT & LABORATORIES

- Hardware: network infrastructure (redundant high speed internet access, certified network equipment providers CISCO, HP, DELL), critical systems powered by UPS with diesel generator backup (power autonomy), dedicated testing platforms, direct communication with in-orbit satellites for testing, measurements and provided service monitoring, redundant data storage servers.
- Software: SW services including virtualized environment for SW testing, validation and verification, centralized SW versioning (git, svn), redundant data storage servers protected by hardware firewall, 24/7 ticketing monitoring service for customer tailored requirements.
- Certificates: ISO 9001, ISO 27001, ISO 14001, ISO 45001.



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## ROMANIAN INSPACE ENGINEERING



### DESCRIPTION

RISE is an R&D focused company developing hardware for space and offering support for both implementing solutions based on space assets and deploying new technologies to orbit. Our expertise covers the whole concept-to-completion spectrum: from requirements definition to verification campaigns we seamlessly guide projects through every phase. Our capabilities span mechanical, electrical, and full stack software development.



### PRODUCTS & SERVICES

#### Space related products

- OrbFIX (GNSS receiver for LEO implementing Galileo HAS)
- Custom TVAC facilities development
- Synoptes (GNSS timestamping device for SSA)
- ECHO GNSS spectrum monitoring network (interference detection and localization)
- Custom GNSS receivers for ground applications

#### Space related services

- Engineering servicing (CAD & electronic design, manufacturing, AIT procedures & test campaigns)
- GNSS data analysis
- EO portal development (software)

#### Non space related products

- Radars for drones
- Radio components
- Commercial GNSS receivers (local distributor)

#### Non space related services

- Engineering services for customized solution
- Data analysis
- Software development
  - Embedded
  - Desktop/PC
  - Server
- Technical support for non-space products



### TECHNOLOGY

- TD 2 Space System Software (TRL 6)
- TD 3 Spacecraft Electrical Power (TRL 6)
- TD 4 Spacecraft Environments and Effects (TRL 9)
- TD 6 RF Systems, Payloads and Technologies (TRL 5)
- TD 8 System Design & Verification (TRL 9)
- TD 10 Flight Dynamics and GNSS (TRL 9)
- TD 13 Automation, Telepresence & Robotics (TRL 6)
- TD 14 Life & Physical Sciences (TRL 6)



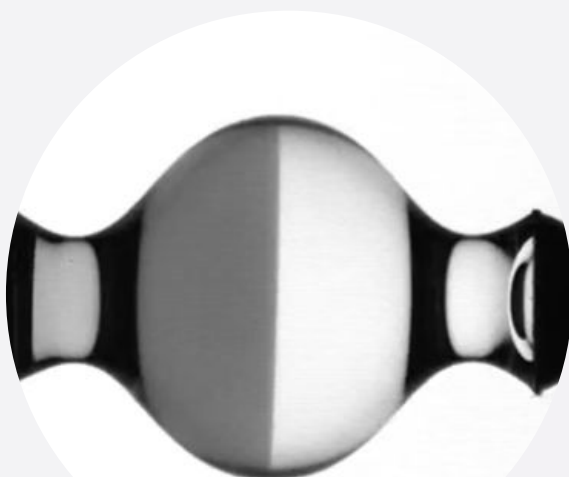
## PROJECTS AND REFERENCES

- DropCoal – Experiment launched and initiated on the ISS in November 2025, DropCoal investigates droplet coalescence in microgravity. Fully designed and manufactured by RISE, the hardware is a complex system that automatically controls droplet formation and records the process at high speed (8000 fps). The unit integrates microfluidic circuitry, a needle-moving mechanism, high-precision pumps and valves, liquid reservoirs, as well as lighting and imaging systems. All accompanying software was also developed internally by RISE. A redesigned sister unit was manufactured and delivered for a re-entry mission aboard the NYX capsule in 2025. It operates completely autonomously once triggered by the capsule and is intended to be recovered after the mission.
- OrbFIX – High precision PVT solution capable of better than 20 cm positioning on LEO. It integrates a GNSS receiver with the latest Galileo E6 HAS processing and the high reliability coming from an intensive qualification process. Combining COTS and Radhard components it is both robust and sufficiently low power to be integrated on small satellites. Having hot/cold redundant configurations, OrbFIX is the best solution for close proximity operations, collision avoidance or other type of multi-spacecraft missions where position and temporal synchronization is need.

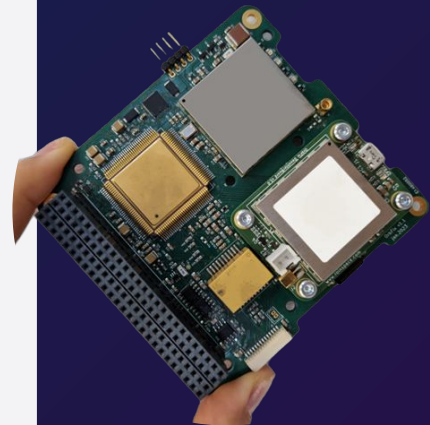
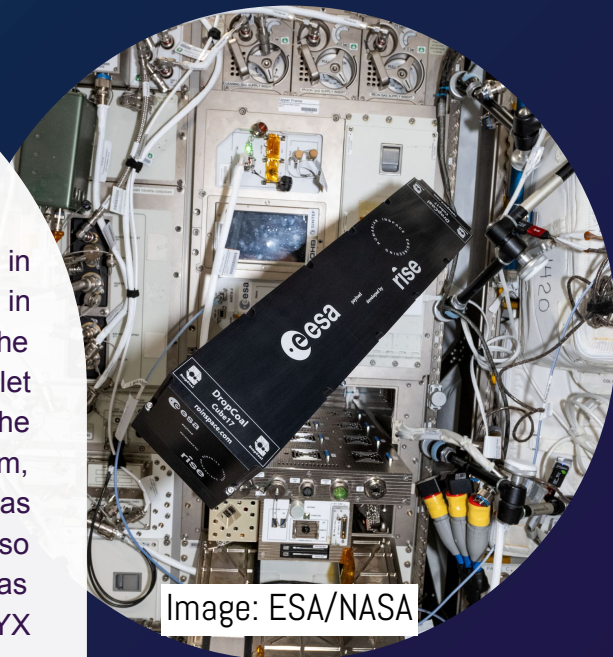


## EQUIPMENT & LABORATORIES

- 2x Operator CAT.3 ECSS-Q-ST-70-61C Through Hole Technology
- > 100 m<sup>2</sup> laboratory space



1st coalescence onboard  
ISS



## CONTACT

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**DESCRIPTION**

Roseal Co. is a Romanian company specialized in manufacturing sealing systems, aiming permanently to fulfill the market - driven requirements for new and innovative performance products. Since 1981, activities include research, design, production and marketing of mechanical and magnetofluidic seals, manufacturing specific spare parts of various materials and services. We have a high commitment professional team who puts a lot of effort to ensure safety and reliability by continuously improving the quality and efficiency of our products

Roseal Co. is developing and manufacturing carbon materials, superaluminous ceramics, elastomer and PTFE for spare parts for almost all kind of industrial sectors: nuclear, petrochemical, oil & gas, water and waste treatments, pharmaceutical, food processing, mining, aerospace etc. ROSEAL Co. provides repair and technical assistance services for mechanical seals, pumps and compressors, as well as training.

**PRODUCTS & SERVICES****Flight Segment:**

- Carbon ring seal
- Static seal ring
- Electric insulated soft magnetic nanomaterials
- Co-based magnetic nanostructured materials

**Non-space:**

- Mechanical and magnetofluidic seals for nuclear equipment, mixer, agitator, reactor, compressor, pump, blower, vacuum application.
- Spare parts manufactured by metal, Silicium Carbide, Wolfram Carbide and in-house made materials (carbon, ceramic, elastomer, PTFE).
- Magnetic nanomaterials: Magnetic nanoparticles (MNP), MNP clusters, magnetic nanofluids (ferrofluids), very high magnetization composite fluids.

Services: technical assistance, seal reconditioning, pump and compressor repairing, training.

**TECHNOLOGY**

- TD 24 Materials and Processes (Novel Materials and Material Technology) (TRL 6)
- TD 8 System Design & Verification (TRL 8)





## PROJECTS AND REFERENCES

- Seal system for Electro-pumps development for suborbital flight vehicles - ESA (GSTP)
- Biosealing for Mars Sample Containment System
- Electric Insulated soft magnetic nanomaterials for space applications. Up-scale demonstration of technology
- Co-based magnetic nanostructured material with potential space applications
- Studies and research regarding to the magnetizable fluids behavior with complex micro and nanostructure in microgravitational conditions



## EQUIPMENT & LABORATORIES

- Reworking lines for metallic, carbonic, carbide, ceramic and non-metallic materials.
- Technological lines for carbon materials, superaluminous ceramics, PTFE and elastomers
- Test bench of sealing systems
- Welding authorization
- Mechanical-physical testing equipment
- Micropilot unit for magnetic nanoparticles, magnetic nanoparticle clusters, magnetic nanofluids and magnetizable composite fluids
- CNCAN authorizations for design, manufacturing and services
- ISCIR authorization for manufacture and installation of elements that retain the sealing pressure for pumps, with the following parameters:  $P_r = 1210 \text{ MPa}$ ,  $D_r = 500 \text{ mm}$ ,  $T = + 5.. 500^\circ\text{C}$ ; and manufacturing, through mechanical reworking, pipe elements, with the following parameters:  $P = 40.0 \text{ MPa}$ ,  $D_{\text{max}} = 500 \text{ mm}$ ,  $T = + 5.. 500^\circ\text{C}$  PT N SCP 1-2008 for nuclear (1, 2, 3, 4) and non-nuclear class (6)
- Certifications: ISO 9001, ISO 14001, ISO 45001



## CONTACT

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## SAB AEROSPACE



### DESCRIPTION

Part of SAB Group (PL, CZ, IT), SAB Romania is focused on Additive Manufacturing and the development of mechanical space systems, subsystems and mechanisms for Satellites and Launchers. Starting from Project Requirements, SAB can perform design, structural and thermal analysis, manufacturing and environmental tests up to the qualification process, including project office activities.



### TECHNOLOGY

- TD 24 Materials and Processes (Novel Materials and Material technology) (TRL 6)
- TD 19 Propulsion (Chemical Propulsion technologies) (TRL 3)



### PRODUCTS & SERVICES

#### Flight Segment:

- Nozzle for Vega E built using additive manufacturing
- Manufacturing of Propulsion Units and components for space sector
- Repair of critical mission components for Launchers and Satellites
- Manufacturing of deployers for Nano-sats and Pico-sats.

#### Ground Segment:

- MGSE's for satellites and Launchers
- Mechanical Testing and Material Characterization

#### Non-space:

- Manufacturing and repairing of small and large mechanical components and parts using Additive Manufacturing for Naval, Agricultural and Automotive Industries.



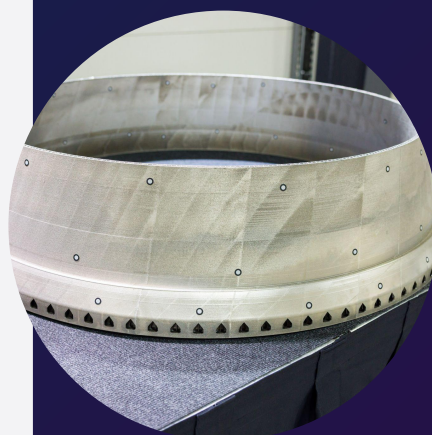
## PROJECTS AND REFERENCES

- RCNE for VEGA-E - SAB is responsible for the manufacturing and testing of Vega E Regeneratively Cooled Nozzle Extension
- PERMATHRUST - ESA ITT for preparation of multi-mission in-space cryogenic propulsion
- Experimental testing of small-scale 3D Printed thrusters for satellites control and propulsion
- Optimization of high Entropy HEA alloys for the aerospace industry through additive manufacturing methods with potential for development in industry.
- Development and Manufacturing of a 3D printed PicoSat Deployer



## EQUIPMENT & LABORATORIES

- Macro Hardness Tester QATM CS200
- Instron 3345 5kN Tensile Machine
- MAHR PS10 Roughness Measurer Probe
- Zeiss T-HAWK 2 3D Scanner
- Analytical Balance for Powder Density and Granulometry testing
- Sieving Station for Powder recycling
- V-Blender Degrize for powder mixing



## CONTACT

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## DESCRIPTION

Sonaca Transylvania (SAT) is a composite, assembly, and metal shop for aeronautics and aerospace located in Cluj, Romania. With more than 150 qualified employees (300+ in 2027), and with the support and space heritage of Sonaca Group, SAT is ready to take on your next challenges in manufacturing of high performance structures and subsystems!

Mainly involved in aeronautics programs for Airbus, Boeing, Embraer, as well as the assembly of the Sonaca aircraft, SAT has extensive knowledge and experience in the industrialization and implementation of large scale projects. Supported by Sonaca Group in Belgium, SAT is able to answer your needs in the design, manufacturing, and testing of high performance structures (composite & metallic) and subsystems. Merging the benefits from our experienced space engineering Belgian colleagues and the industrial efficiency of our Romanian capabilities is bringing the best of both worlds to address your needs on time, on cost, and on quality!



## PRODUCTS & SERVICES

Flight Segment:

- Composite parts design, manufacturing, and testing.
- Metallic parts design, manufacturing, and testing.
- Complex assemblies design, manufacturing, and testing.



## TECHNOLOGY

- TD20 Structures (TRL9)





## PROJECTS AND REFERENCES

- **Ariane 6** - Composite Aerodynamic covers
- **Ariane 6** - Back Covers (Metallic) assembly



## EQUIPMENT & LABORATORIES

Sonaca Transylvania, located in Moldovenesti, Cluj county

- End-to-end composite shop, with 2 large autoclaves (> 9m x 4m),
- 5-axis large machining capability,
- Assembly workshop,
- (2027) end-to-end metallic workshop including surface treatment TSA/PSA.



## CONTACT

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## SONOVISION ROMANIA



### DESCRIPTION

Sonovision Romania is part of Ortec Group with the following main business activities: Electrical Space Engineering, Space Qualified Harness Build to Spec, Integrated Product Support (maintenance engineering, procurability, CBT), and MGSE.



### TECHNOLOGY

- TD 23 EEE (electric, electromechanical & electronic) Components and Quality
  - Service module and payload harness – TRL 9
  - Ground Test Harness – TRL 9
- TD 8 System Design and Verification (TRL 9)



### PRODUCTS & SERVICES

#### Flight Segment

- High Reliability Harness – design, development, manufacturing, integration and testing.
- Electrical Interface Control Drawing
- Co-engineering
- Life cycle analysis

#### Ground Segment

- Ground Test Harness and manufacturing
- Ground extension bundles
- CAD simulations
- Mock-up, JIG and container design
- 3D printed parts
- Life cycle analysis

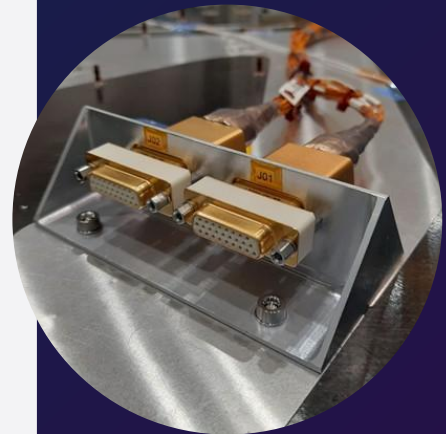
#### Non-space

- Integrated Product Support (ASD Standards) for: Airbus, Airbus Helicopters, Dassault, Safran, Lufthansa Technik, Safran Aircraft engines



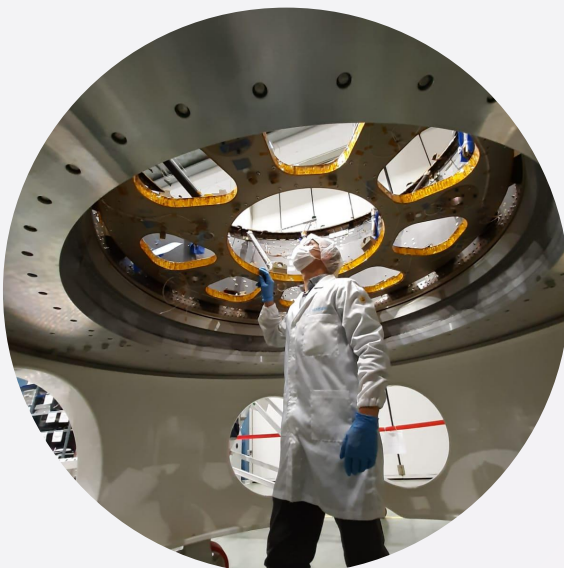
## PROJECTS AND REFERENCES

- Lunar Gateway International Habitation Module (I-HAB) Harness - Design, Development, Manufacturing, Integration and Test
- Ariel Harness - Design, Development, Manufacturing, Integration and Test
- Euclid SVM Harness - Design, Development, Manufacturing, Integration and Test
- Euclid Ground Extension bundles - Design, Development and Manufacturing
- Ariane 6 -TAC Harness manufacturing
- OIP – Altius FPA IS control IF predevelopment prototype harness
- Space Rider - EICD development
- FORUM Harness - Design, Development, Manufacturing, Integration and Test
- IOD-IOV Harness - Design, Development, Manufacturing, and Test
- QKDSat Harness - Design, Development, Manufacturing and Test



## EQUIPMENT & LABORATORIES

- Laboratory (400 m2) & Clean Room (ISO 7, 120 sqm, 5 m height)
- Specific facilities for ground harness manufacturing
- Crimping certified personnel (ECSS-Q-ST-70-26C)
- Soldering certified personnel (ECSS-Q-ST-70-61C)
- Automatic test bench tools (WEETECH)
- Certifications ISO 9001, EN/AS/JISQ 9100



## CONTACT

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### DESCRIPTION

Terma Space Romania is the key provider of ground support equipment for satellite testing. From 2013, Terma Space Romania SRL started its activities in the Space domain, focusing on Electric Ground Support Equipment (EGSE), Mission Control Systems (MCS) and Earth Observation topics, in the Payload Data Ground Segment / Identity and Access Management area. Terma Space Romania Unit has been working for ESA for many years and has up to now already successfully executed many projects in the space domain. Terma Romania has a team of very ambitious Romanian engineers that have already successfully contributed to several ESA projects. We implemented and still are implementing Central Check-Out Systems/Core EGSE, MPDU's, RF SCOE's, RF SUITCASE's, Power and Launch Base SCOE systems, etc. Terma in Romania has significantly participated in the development of the ESA Mission Control System SCOS-2000, the new EGS-CC and new ESA ground stations systems such as TTCP. We have also experience in Earth Observation Identity and Access Management projects, elaborations of the new SW/IT technologies for the upcoming European Ground Segment Common Core (ESA Study European Ground Segment – Proof of Concept) and in mission check-out and mission control activities.



### PRODUCTS & SERVICES

#### Ground Segment:

- Electric Ground Support Equipment (EGSE) – e.g. Power SCOE, RF SCOE, Instrument and Payload EGSE, Central Check Out Systems
- Integration of own products in the above mentioned solutions: Baseband TMTC Frontend and TMTC Crossbar, ProUST-USAS, ProUST-FE, ProUST-SLP
- Ground Stations
- Mission Control Systems
- Identity and Access Management
- Development of own products:
- Software defined radio (with the support of ROSA)
- Contribution to the development of space software owned by Terma group: CCS5 – Core EGSE Software



### TECHNOLOGY

- TD 8 System Design and Verification (TRL 7)
- TD 2 Space System Software (TRL 6/7)
- TD 12 Ground System Station and Network (TRL 6/7)
- TD 9 Mission Operation and Ground Data Systems (TRL 7/8)
- TD 6 RF Systems, Payloads and Technologies (TRL 7)
- TD 25 Quality, Dependability and Safety





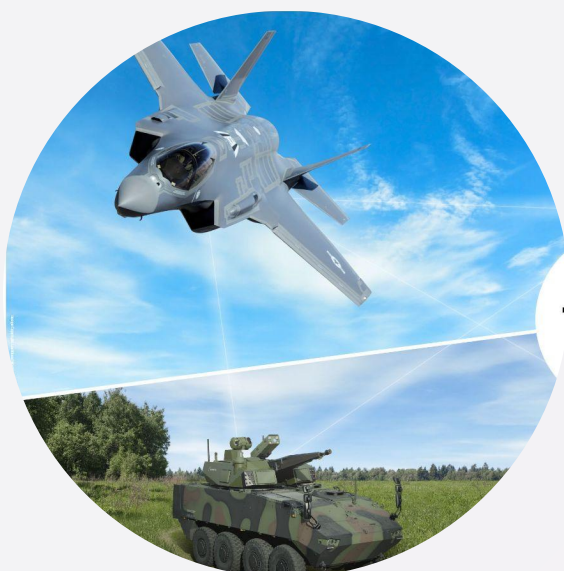
## PROJECTS AND REFERENCES

- EGSE for ESA missions
  - Copernicus 4 CIMR
  - Copernicus 4 ROSE-L
  - Copernicus 4 CHIME
  - Copernicus LSTM
  - Space Rider
  - Mars Sample Return
  - Galileo
  - Comet Interceptor
  - Hera
  - I-HAB
  - Plato
  - One Web
  - Biomass
  - Juice
  - MetOP
  - Sentinel 5 & 6
  - Euclid
- Earth Observation - Identity And Access Management
- Deep space communication protocol for ESA (DTN)
- Mission Control - Proba 3
- Mission Planning - EGS-CC



## EQUIPMENT & LABORATORIES

- Integration & test laboratory
- Mechanical room
- Electrical room



## CONTACT

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## TERRASIGNA



### DESCRIPTION

Since 2007, Terrasigna has been a leading Romanian company in satellite data technology, Big Data, Artificial Intelligence, and Machine Learning. The team of 12 expert PhDs delivers high-end solutions for risk assessment, modelling, and data exploitation and in-house algorithms and platforms validated at the international level, ensuring the highest quality services.

Partners:

- Financial Institutions: World Bank, Inter-American Development Bank, BERD, PAID
- Agencies/Authorities: Space agencies (NASA, DLR, ESA, ROSA), Ministry of Environment, National Agency for Payments and Intervention in Agriculture (APIA)
- Professional Partners: AIRBUS, THALES, SIXENSE.



### PRODUCTS & SERVICES

- EO satellite data based services for: insurance, agribusiness, fisheries, forestry, environment, infrastructure
- Security and Defense Data exploitation / AI / ML
- Data Management and Exploitation Platforms
- Big Data/Data Mining/Artificial Intelligence/ Machine Learning
- Educational Software
- Ground Based Radar Systems (hardware)



### TECHNOLOGY

- TD 2 Space System Software (TRL 3-9)
- TD 26 Others



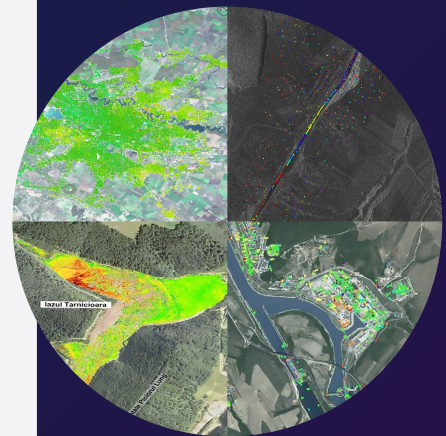
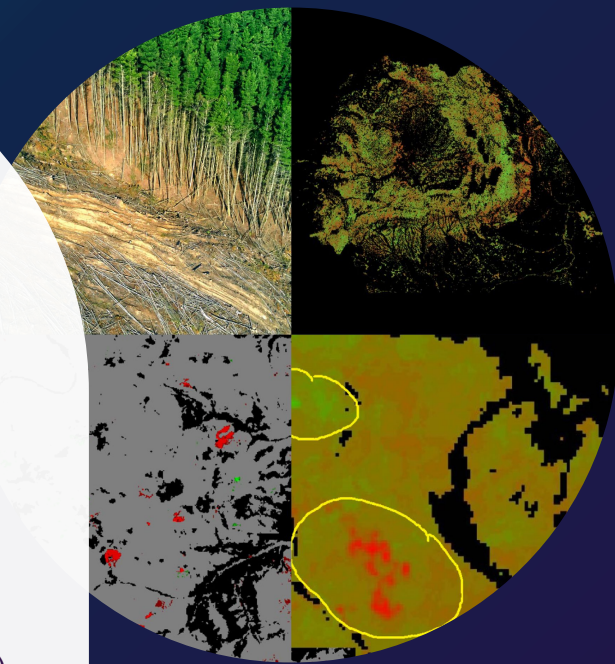
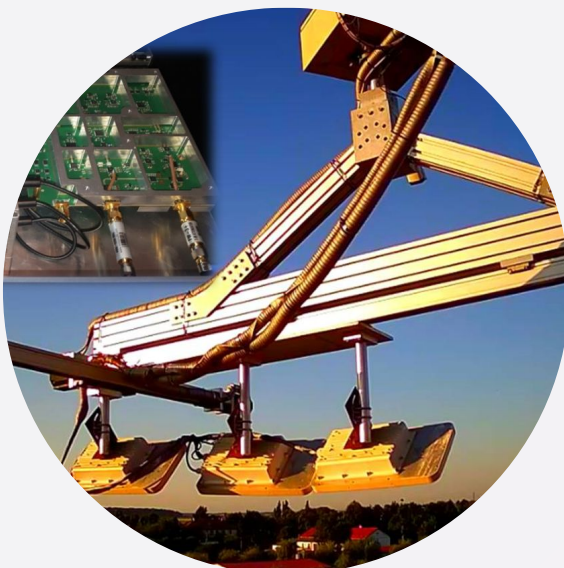
## PROJECTS AND REFERENCES

- Geospatial Intelligence for the Reinsurance Sector (Geoinsure)
- Further Expansion Of EO Uptake Supporting International Development Bank Projects (FEOSID)
- Campaign Support For Sentinel-1 companion Satellite (CS) System Studies (Campaign S1\_T-SAR)
- Black Sea and Danube Regional Initiative Applications – Priority Application Domain D: Black Sea Coastal Zone Management (EO4CZM)
- Earth Observation services for Black Sea Protection (EO4BSP)
- Earth Observation Services for Fishery, Bivalves Mariculture and Oysterground Restoration along European Coasts (FORCOAST)
- Technologies for the Management of LOnG EO Data Time Series (LOOSE)
- Deep Learning Data Fusion for Earth Observation (EOSmith)
- Expansion Of EO Uptake In Developing Countries (EODAT)
- Data-Driven Bioeconomy (DataBio)
- Pathfinder Assessment For Regional High Volume Data Access, Processing And Information Service Delivery Platforms For South Eastern Europe Region (EO4SEE)



## EQUIPMENT & LABORATORIES

- SPI/RPI Tomographic C-Band SAR Infrastructure for Earth Observation Applications



## CONTACT

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## THALES ROMANIA



### DESCRIPTION

Thales Systems Romania is a highly skilled software competence center, which participates together with Thales Alenia Space in major space projects (e.g IRIS2, Novacom II, Copernicus, Galileo), while also addressing the needs of local space projects or ESA initiatives.



### PRODUCTS & SERVICES

#### Flight Segment:

- Space Inspire: fully reconfigurable satellite product line for in-orbit reconfiguration – activities both on ground and on-board software components
- Kineis: flight OBSW for a 14 nano-satellite navigation constellation
- Novacom: Engix, DTP, OBSW (SW platform and simulation models), SDB (satellite database)
- Cristal: Copernicus Polar Ice and Snow Topography Altimeter
- I-HAB: flight computer module SW (software platform development)
- ORCHIDE: Onboard software orchestration solution for distributed processing
- OBC-hosted star tracker SW (RIIS)
- Autonomous Orbital Navigation (AUTONAV) OBSW for orbital transfer of electric satellites

#### Ground Segment:

- SpaceOps - Solution for the configuration and monitoring of telecom satellites. Developing two components: PTM (Payload Traffic Manager) & PCM (Payload Configuration and Management), SpaceFleet (management of a fleet of telecommunication satellites)
- SpaceGate - Data center modules for a network access system solution that connects enterprise terminals to Internet Service Providers through satellites
- Calibration - Product that helps to adjust amplitude/phase errors, but also to correct antenna pointing errors for Space Inspire telecom satellites
- Kineis - Developing the central ground segment element of the KINEIS system Mission Control Segment
- Hydron-DS Network Control Center (HNCC)



### TECHNOLOGY

- TD 1 Onboard Data Systems (TRL 9)
- TD 2 Space System Software (TRL 9)



- Meteosat Third Generation – Developing the Ground Segment Processing Infrastructure within the Instrument Data Processing Facility
- Satellite Based Augmentation System (SBAS) ARAIM (Advanced Receiver Autonomous Integrity Monitoring) demonstrator – algorithms and front-end



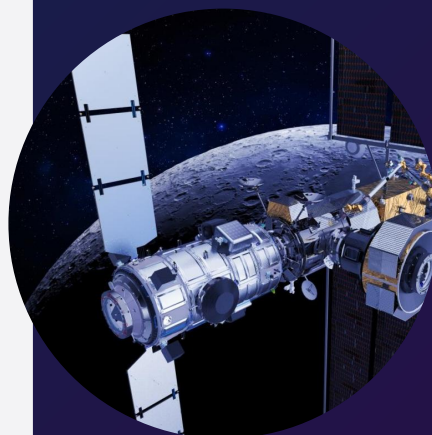
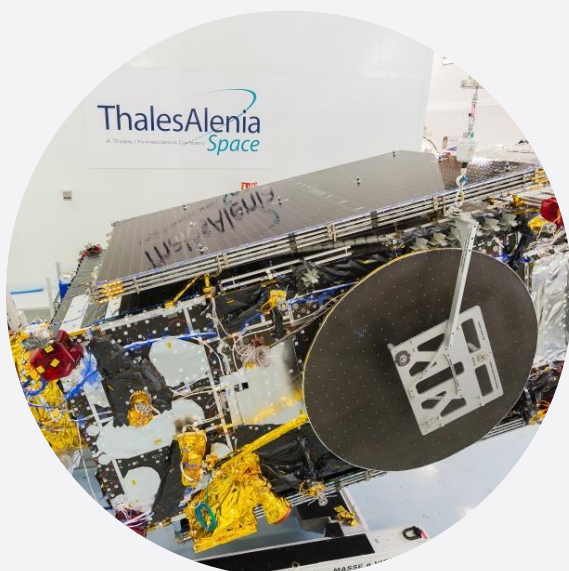
## PROJECTS AND REFERENCES

- Space Inspire™ - Thales Alenia Space software-defined payload – activities both on ground and in-flight segments
- SpaceOps – the product line to configure monitor and control the geostationary telecom satellites
- IoT geolocation systems – Kineis and OmniSpace
- Satellite-based augmentation systems ARAIM demonstrator
- MeteoSat Third Generation - Europe's next generation INNOVATIVE geostationary meteorological satellites – developing the Sounder Processing Infrastructure product
- Copernicus Carbon Dioxide Monitoring mission, CO2M
- Copernicus Polar Ice and Snow Topography Altimeter, CRISTAL
- Lunar Gateway – iHab and Esprit Flight Control Module (FCM)
- EngiX - global Project Management online solution for Space
- Hydron-DS



## EQUIPMENT & LABORATORIES

- Thales Romania has access to Thales Alenia Space in TAS Toulouse and Cannes facilities in France and TAS Milano and Rome facilities in Italy.



## CONTACT

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## TTTECH DEVELOPMENT ROMANIA S.R.L.



### DESCRIPTION

TTTech Development Romania SRL was founded in 2006 and has been based in Bucharest ever since. The company is specialized in chip development and the verification and validation of digital chip IP in particular, mainly for safety-critical applications. The Bucharest site is certified according to EN9100 and ISO 9001.

TTTech Group is present in several European countries and is a global champion in safe, networked embedded control. TTTech Development Romania SRL has been heavily involved in the Group's most complex development projects ranging from Audi's central driver assistance control unit ("zFAS") and switches for commercial aviation ("SMC") to fault-tolerant data networks for human space-flight programs (Orion, Artemis).



### TECHNOLOGY

- TD 1 Onboard Data Systems (TRL 9)
- TD 2 Space System Software (TRL 7-9)



### PRODUCTS & SERVICES

Space and Non-space:

- Chip engineering (development, integration, verification and validation) related to high-performance networking
- Embedded software running on LEON 2 and other CPU cores for the management of TTEthernet switches (firmware)
- Product assurance and certification according to space and aviation standards (DO-254 in particular)



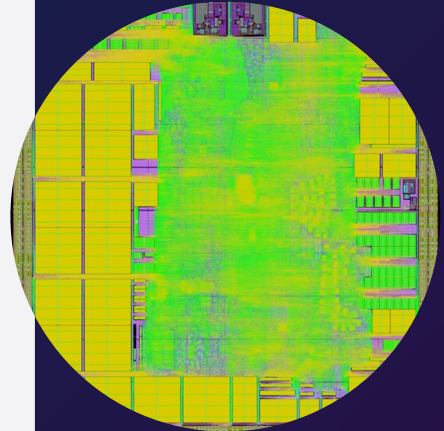
## PROJECTS AND REFERENCES

- NASA Orion MPCV (with Honeywell) - TTEthernet switch IP
- ESA FLPP 3 “TTEthernet Switch ASIC” - switch chip IP and V&V
- ESA Ariane 6 on-board data network - switch software development (chip firmware) and V&V support
- Lunar Gateway: ESA International Habitation Module - switch software (license to chip firmware) and product assurance
- Several proposals related to Deterministic Ethernet (TTEthernet and TSN/AVB)



## EQUIPMENT & LABORATORIES

- TTTech Development Romania is part of the TTTech Group. The modern local facilities in Bucharest are for chip and software development. There is (digital) access to the group laboratories and extended test stands in Vienna, Austria.



## CONTACT

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