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SLOVENIA**

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**GREEN.
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CATALOGUE OF SLOVENIAN SPACE INDUSTRY COMPANIES AND RESEARCH INSTITUTIONS



REPUBLIC OF SLOVENIA
MINISTRY OF THE ECONOMY,
TOURISM AND SPORT

The Slovenian Space Sector

Slovenia has a long tradition as a space nation. From Herman Potočnik Noordung's visionary book *"The Problem of Space Travel: The Rocket Motor"*, Slovenian science and industry have been developing new solutions for exploring the universe and facilitating better use of space data in all areas of life.

Slovenian space activities are under the authority of ministry, responsible for economy, which closely cooperates with other relevant ministries and institutions to promote and raise awareness of space activities, especially among business community and academia. In April 2023, Slovenian Space Office was established within this ministry.

In 2016, Slovenia joined the space nations by concluding an Association Agreement with the European Space Agency (ESA), which has since been upgraded with the conclusion of a new Association Agreement in 2020. *Slovenia is strongly committed to become a full ESA member and is currently preparing the next steps, including preparation of a national space strategy, to achieve this important goal.*

ESA plays an important role in developing Slovenian space sector and at the Ministerial Council of ESA in 2022 we decided to increase our contributions

and to join new optional programs. As for now, Slovenia has subscribed to the following optional programmes of ESA: GSTP (General Support Technology Programme), Future Earth Observation, Digital Twin Earth, InCubed, HRE (Human Spaceflight and Robotic Exploration Programmes) and BASS (Space Solutions and Business Applications).

Slovenian companies are engaging in various fields of the space industry, with a special focus on niche products and services, such as applications connected to earth observation and the processing of big data obtained from space for different purposes (from agriculture to rescue operations and traffic), control and measuring systems, new materials that can be used in the harsh space environment, artificial intelligence, 3D printing, robotics, equipment for ground stations (antennas, domes, measuring instruments), micro coolers, new solutions in the field of miniaturisation, microgravity facilities, on-board monitoring of health conditions of astronauts, micro- and nanosatellites, on-board computers and others.

Slovenian companies have developed several breakthrough applications for processing space data, which are successfully used in agriculture, water

monitoring, spatial planning, rescue and early warning operations, and numerous other fields.

In September 2020, the first Slovenian satellites, Nemo HD and TriSat, were launched into the LEO, and joined by the third one, TriSat R, which was launched into the MEO, in 2022. With near real-time multispectral images and videos from space, Slovenia's first two satellites have made an additional step forward, featuring new miniaturised equipment for operation in the harsh space environment. The third micro satellite in MEO focuses on miniaturisation and robustness of the equipment that can be used above the LEO.

Slovenia has joined the ESA's Human Spaceflight and Robotic Exploration Programmes (HRE) to help stimulate the inclusion of new research institutions and industry in the space sector (e.g. recycling, 3D printing, robotics, AI, health, etc.). In addition, the Jožef Stefan Institute conducts "bed rest studies" implemented by the Laboratory for Gravitational Physiology (an ESA ground-based research facility) located at the Planica Nordic Centre, Slovenia. In 2021, an upgraded short-arm human centrifuge (SAHC) was transferred to the Centre, which makes Slovenia one of the three ESA Member States with SAHC to carry out the "bed rest studies". The results of the bed rest study can be used to prepare for human spaceflight and will be of great help in preparing for future missions.

In recent years, space activities have been increasingly becoming the focus of industry and research institutions. Slovenia's ambition is to involve new companies in space activities, working hand in hand with research institutions and universities.

We see space sector as one of our priority sectors and our Ministry strongly supports development of this segment of economy. Cooperation between the Government, industry and research is essential in order to follow rapid developments in space technologies, as well as international cooperation.

We should not forget the important role that space technologies can play in accelerating economic growth and enabling faster green and digital transition.

Slovenian companies specialise in demanding high-tech niche products and services and they excel in global markets. We are convinced that their services and solutions are interesting also for foreign partners wishing to improve their performance and competitiveness in space sector.

The catalogue of Slovenian space industry and research institutions can be a useful tool for potential partners to find the right match in Slovenia.

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Flycom Technologies	Airborne and mobile remote data acquisition, data processing and data management					•	•				32
GeoCodis	Remote sensing software					•	•				34
Guardiaris	production of custom-designed indoor and outdoor simulators	•				•				•	36
Ineor	Complete software development services and breakthrough key innovative digital solutions	•	•	•	•	•	•	•	•	•	38

		Ground Systems	Launchers	Life in Space	Satellites	Space Applications	Earth Observation	Space Exploration	Space Mining	Space Settlement	
Instrumentation Technologies	Data Acquisition solutions	•		•	•	•	•	•			40
Intectiv	Printed circuit boards	•	•		•	•	•				42
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Kens	Printed Circuit Boards	•	•			•					46
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Magneti Ljubljana	Magnets	•	•	•	•	•	•	•	•	•	50
Marsi	3D metal printing, additive technologies	•	•		•	•					52
Paradigma	Communications (transmitters, receivers)	•			•						54
Riedl	Precision high-quality metal products for automotive, nautical and aviation industry	•			•	•					56
SIJ Metal Ravne	Special steels, Ni and Ti alloys	•	•		•						58
Sinergise	Geospatial information systems						•				60
Skylabs	Miniaturised satellite platforms, space engineering				•	•		•			62
Space-SI	Small satellite applications, ground stations	•			•	•	•				64
STN	Teleport facility, connectivity	•			•						66
XLAB	AI and HPC tools, 3D analyses			•		•	•		•		68
Zlatarna Celje	Synthesis of nanoparticles, gilding, nano inks				•	•	•	•			70
ŽustAI	Milling and welding of special materials		•		•	•		•	•		72

SHORT DESCRIPTION OF THE COMPANY

Aalta Lab is a company offering services in data analytics and HPC software development. We are taking part in European H2020 projects and projects for the European Space Agency, while providing services to industrial clients and partners in various domains. More than 30 external experts in different areas work with us to improve the competitiveness of our industrial clients. We use innovative approaches to provide insight into the secrets of the data and the processes behind them. We exploit the knowledge gained to help make well-informed decisions.

Aalta Lab is in the process of launching a spin-off in the domain of climate services and energy.

SPACE SEGMENTS THAT ARE MOST RELEVANT FOR YOUR COMPANY

- Space applications
- Earth observation

MAIN ACTIVITIES/PRODUCTS/SERVICES RELEVANT FOR THE SPACE SECTOR

- Data analysis,
- HPC software development,
- Development and implementation of algorithms,
- Development of simulators.

VALUE PROPOSITION/OFFERING

We provide the AI/ML know-how and help with custom data analytics and AI/ML solutions. Depending on your problem, we can perform the analyses, develop models and implement the solution according to your needs. We develop customised algorithms according to your specific requirements and implement them in such a way that you can fully exploit the benefits of multi-CPU and multi-GPU infrastructure. With our help, our customers get optimised software which tends specifically to their needs. In this way you will be able to complete your work in a shorter time and focus on more projects.

We are combining our technological expertise with industry-specific knowledge. Our extended team is currently developing a number of space-driven data intelligence products for climate and energy forecasting. These downstream products will be released in 2023.

REFERENCES IN SPACE INDUSTRY

- RPS Experiment (European Space Agency – H2020-ESA-038.15)
- Hermes-SP (H2020-SPACE-2018)
- Gaia Transients (European Space Agency, University of Nova Gorica)
- Lifeline (European Space Agency – 4000132262/20/NL/GLC/hh)
- Définition d'un référentiel spatio-temporel autonome dans un constellation de satellites (TéSA ASSOCIATION and Paris Observatory)

Aalta Lab d.o.o.

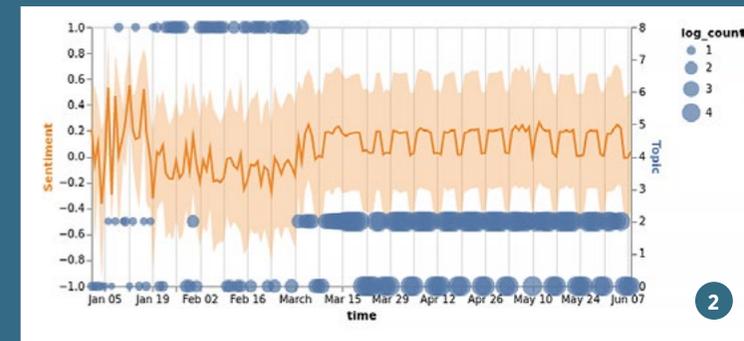
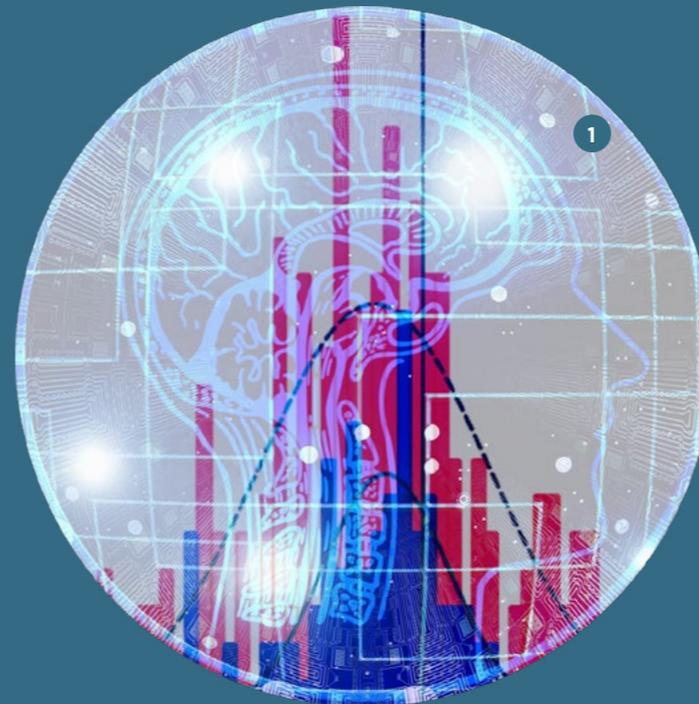
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1 Artefact

2 A plot showing information and various results in a graphical form

SHORT DESCRIPTION OF THE COMPANY

Arctur is a hi-tech SME with more than 30 years on the market. We specialise in HPC (High-Performance Computing) for SMEs and Tourism 4.0 – unlocking the innovation potential by enabling collaboration between all stakeholders of the smart tourism ecosystem to co-create enriched experiences with the help of the key enabling technologies from Industry 4.0. Furthermore, Arctur has considerable experience in collaborating on and coordinating European and national-funded projects.

During the past 15 years, Arctur has been contributing to numerous Horizon Europe, H2020, Digital Europe, Interreg, Erasmus+, EMFF and national projects and has been a successful partner in FP7 projects.

SPACE SEGMENTS THAT ARE MOST RELEVANT FOR YOUR COMPANY

- Space applications
- Earth observation

MAIN ACTIVITIES/PRODUCTS/SERVICES RELEVANT FOR THE SPACE SECTOR

The **Tourism Impact Model (TIM)** is an award-winning tool using real data (inc. space data) to create an objective picture of the impact of tourism in a specific micro-location. TIM brings real data to the perception of the impact of tourism to sharpen the real picture for everyone and allow data-driven strategic planning. Arctur realised the potential of data which is why ESA projects such as SD4TIM are the perfect entry point for using satellite data in tourism.

High-performance computing and Cloud services (SaaS): Arctur has its own HPC and Cloud Computing infrastructure in a distributed, high-redundancy environment. The company has extensive experience in the deployment of complex IT systems for small and medium-sized enterprises (SMEs) in various sectors: from manufacturing to tourism and cultural heritage.

VALUE PROPOSITION/OFFERING

Arctur – where creativity meets experience!

For more than 30 years Arctur has been pioneering by merging research, science, art and business. The interdisciplinary spirit is the cradle of innovation in which concepts, solutions and products come to life under the motto: We don't follow the changes, we co-create them!

REFERENCES IN SPACE INDUSTRY

- Project SD4TIM: implementing satellite Earth Observation data into Tourism Impact Model

Arctur computer engineering d.o.o.

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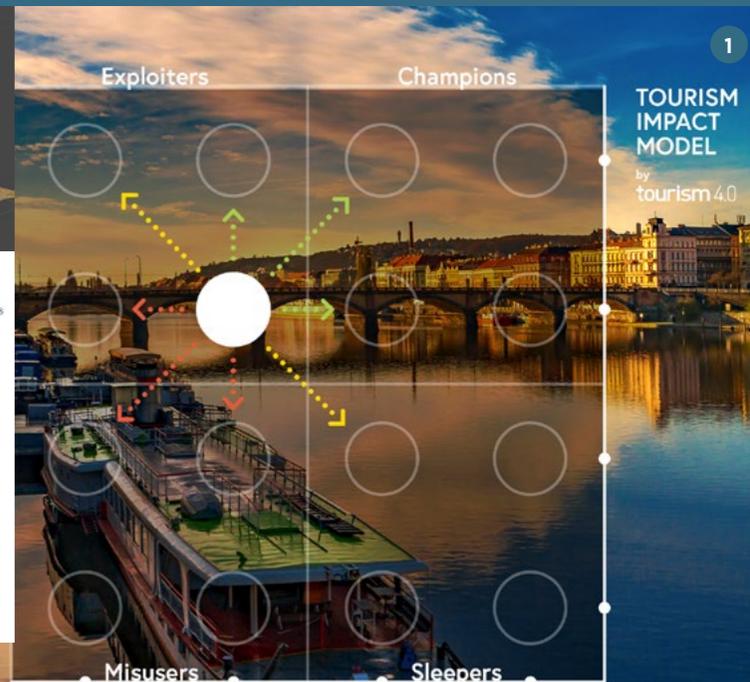
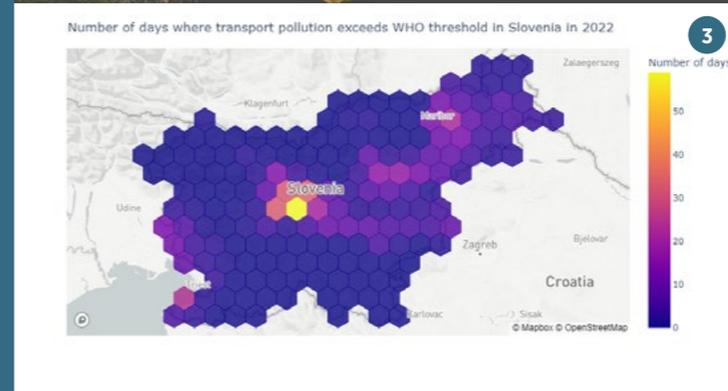
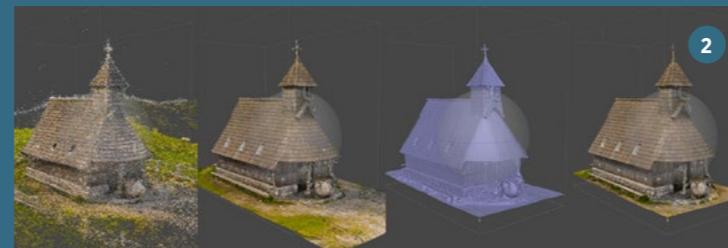
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Arctur team in a computer room



Are your decisions based on the right data?

quick and competent response in all situations

1 Graphic representing final Tourism Impact Model (TIM) result showing the positive and negative impacts of tourism for a destination presented by their placement on what looks like a coordinate system. Below the graphic is the question "Are your decisions based on the right data?" followed by "quick and competent response in all situations".

2 A sequence of 4 pictures showing how a 3D model of a wooden chapel in Velika planina is constructed. First picture is showing a point cloud of real-life pictures, taken to construct the 3D model. And the rest are showing the steps towards the final render.

3 A map of Slovenia with an overlay showing the number of days transport pollution exceeded the WHO threshold in Slovenia from January to September 2022. From the overlay, it is clear that the most affected area in Slovenia is Ljubljana (more than 50 days) and its surroundings, followed by Maribor (around 30 days) and its surroundings.

SHORT DESCRIPTION OF THE COMPANY

Company BALMAR d.o.o. is privately owned small enterprise (SME), established in 2008. It provides services and R&D activities for aerospace, space, automotive, biomedicine and the defence industry. The major scope of the company's activities relates to Advanced Manufacturing/Additive Manufacturing providing prototyping, technology and product evaluation, industry implementation, learning and technology promotion. Major business partners of the company in space industry are European Space Agency (ESA), Beyond Gravity Germany GmbH, Mongolian Airways Europe (MAE) and Grupoinex Inversiones, S.A.

SPACE SEGMENTS THAT ARE MOST RELEVANT FOR YOUR COMPANY

- Space applications
- Satellites (structures)
- Launchers
- Space exploration
- Space mining

MAIN ACTIVITIES/PRODUCTS/SERVICES RELEVANT FOR THE SPACE SECTOR

- Development of advanced metal products for space structures, space mechanisms and propulsion systems,
- Additive manufacturing of metal products for space structures, space mechanisms and propulsion systems,
- Classical machining of metal products for space applications,
- Advanced joining solutions for structural elements,
- Effective repair solutions for space applications,
- Improvements and upgrades of manufacturing technologies for space applications,
- R&D and testing of metal materials for space applications,
- Function-gradient metal materials for advanced space applications.

VALUE PROPOSITION/OFFERING

BALMAR Company provides wide range of products and services for Space and Aerospace Industry. Major advantage is company flexibility in product's designs and manufacturing process, enabling development and production of space products with high added value.

REFERENCES IN SPACE INDUSTRY

- European Space Agency (ESA): Development, Prototyping and Manufacture of special Metal Components for Space Applications with Advanced Laser Technology LENS (LENS FOR SPACE); Contract No. 4000103860/11/NL/KML.
- European Space Agency (ESA): Assessing the Use of Advanced Manufacturing to Improve and Expand Space Hardware Capabilities; Contract No. No.4000121982/17/NL/BJ/gp.
- European Space Agency (ESA): Secondment of Dr. Simon Malej at ESA as the Advanced Manufacturing Engineer in the Structures and Mechanisms Division (TEC-MS), ESTEC, the Netherlands.
- European Space Agency (ESA): New Approach to Improve Mechanical and Wear Resistance Properties by Hybrid Additive Manufacturing of Ti-Alloy (Ti-TiC MMC); Contract No.4000138315/22/NL/SC.

BALMAR d.o.o.

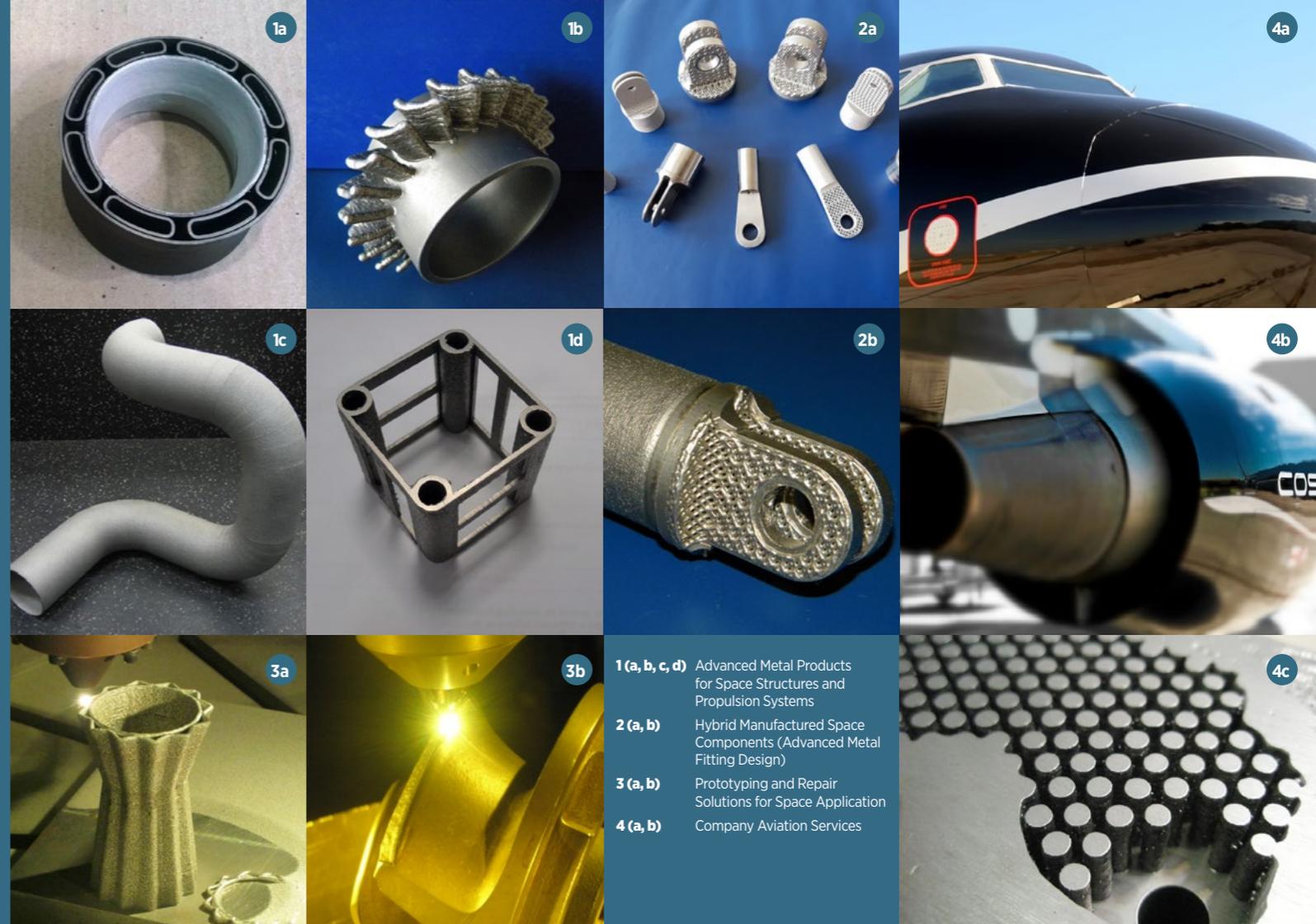
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1 (a, b, c, d) Advanced Metal Products for Space Structures and Propulsion Systems
2 (a, b) Hybrid Manufactured Space Components (Advanced Metal Fitting Design)
3 (a, b) Prototyping and Repair Solutions for Space Application
4 (a, b) Company Aviation Services



SHORT DESCRIPTION OF THE COMPANY

Bias Variance Labs (BVL) is a research-led SME, established by experts with long-standing experience in developing cutting-edge AI solutions for modelling and analysing complex systems in space research and technology. The BVL blend of expertise provides a unique and holistic view of the data-to-discovery and decision process, leading to successful development of solutions using state-of-the-art explainable approaches that leverage the latest developments in AI.

SPACE SEGMENTS THAT ARE MOST RELEVANT FOR YOUR COMPANY

- Earth observation
- Spacecraft operations
- Space exploration

MAIN ACTIVITIES/PRODUCTS/SERVICES RELEVANT FOR THE SPACE SECTOR

GalaxAI, a novel, easy-operable, AI toolbox for spacecraft health monitoring. Use cases include:

- GalaxAI-MEX – ML predictive analysis of MEX’s thermal-power consumption for better mission planning and improved science return,
- GalaxAI-INTEGRAL – ML for optimal operation of INTEGRAL’s onboard instruments, leading to up to 2h per orbit of additional science time.

AiTLAS, an AI ecosystem for data analysis, model development, and benchmarking accompanied by readily usable model catalogues and semantically annotated EO-data repositories. The ecosystem is open-source and readily applicable to various EO tasks and workflows. The AiTLAS Ecosystem consists of:

- AiTLAS Core – a novel library for development and analysis of AI models for a variety of EO image tasks,
- AiTLAS Benchmark Arena – an open-access benchmark suite for evaluating state-of-the-art AI approaches for EO image classification, comprised of experiments from more than 500 AI models,
- AiTLAS Data Catalogue – an ontology-powered, annotated repository, allowing easy access, querying and analyses of semantically enriched EO-data.

VALUE PROPOSITION/OFFERING

BVL provides novel, deep-tech solutions that address all aspects of the data lifecycle: Data storage and stewardship, Data and knowledge representation, Machine learning, Data analysis, and visualisation.

Our mission is to provide open-data, open-source & open-science with easy-to-use, re-use & deploy solutions through modular and intuitive design.

REFERENCES IN SPACE INDUSTRY

- GalaxAI: Machine learning for space operations (ESA)
- AiTLAS: Artificial Intelligence for Earth Observation (ESA)
- TII ALS ML: Automatic detection of archaeological features from LIDAR data using machine learning techniques (TI Ireland)
- Organisation of ML for space events (ML for spacecraft health @ SMC IT 2021, AI for spacecraft longevity @ IJCAI 2021, Space & AI 2021)

Bias Variance Labs, d.o.o. (BVL)

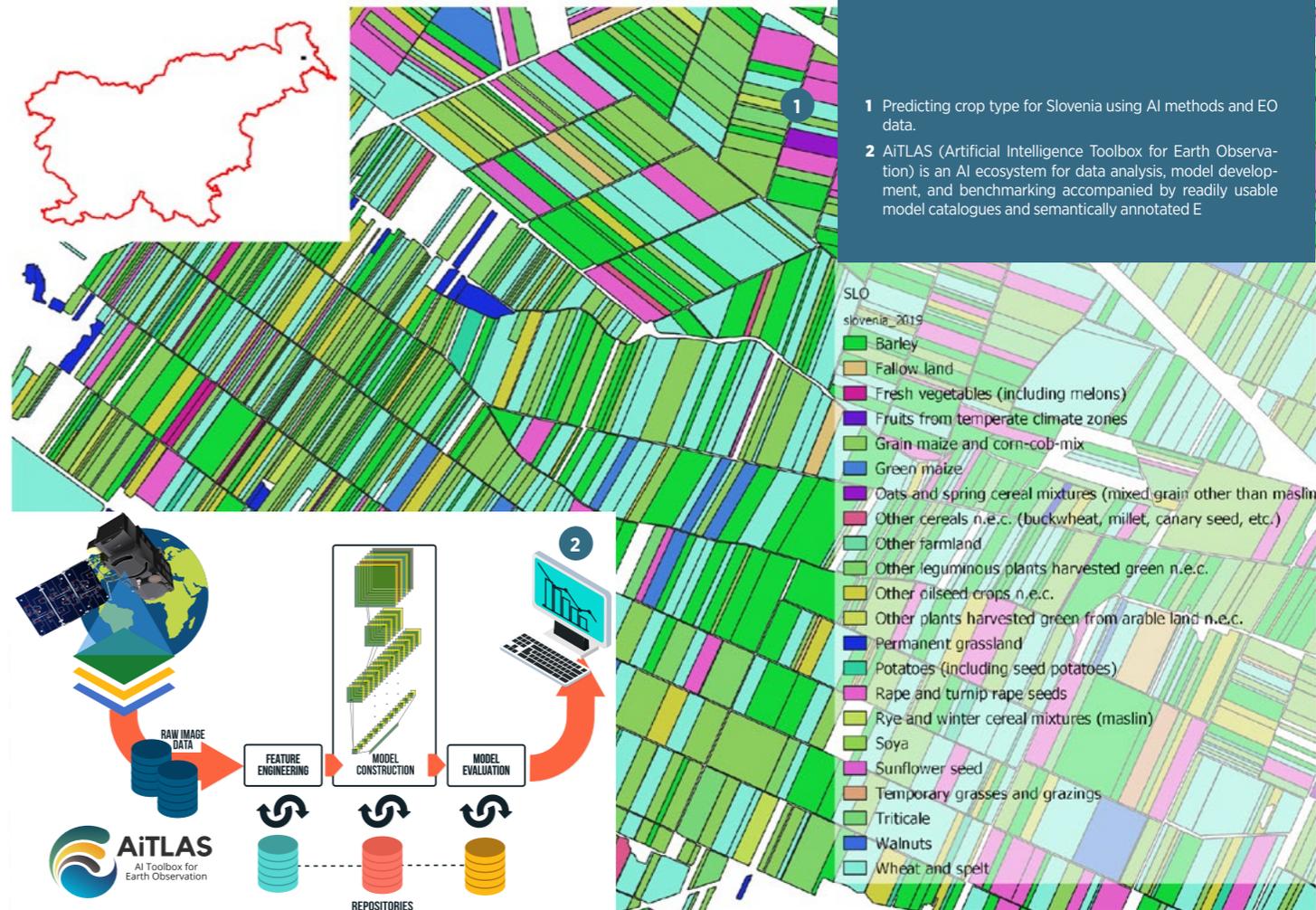
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Crop type prediction (Slovenia, 2019)



SHORT DESCRIPTION OF THE COMPANY

C3M stands for Centre for Computational Continuum Mechanics. It is a high-tech company specialised in the development of customised numerical solutions based on the finite element method (FEM). These solutions are used in inverse modelling, sensitivity analyses and optimisation for Multi-field, Multi-scale, Multi-body, Multi-phase and Multi-objective (M5) problems. C3M has an advanced software development strategy that is based on a symbolic approach to automatic code generation, allowing solutions to be developed for a wide range of industrial and scientific problems.

SPACE SEGMENTS THAT ARE MOST RELEVANT FOR YOUR COMPANY

- Launchers
- Life in space
- Satellites
- Space applications
- Space mining
- Space settlement

MAIN ACTIVITIES/PRODUCTS/SERVICES RELEVANT FOR THE SPACE SECTOR

- Multi-scale digital twins of a satellites,
- Digital twins of advanced manufacturing processes,
- Reliable modelling of functionally graded materials,
- Optimisation of material structure at micro level,
- Thermal digital twins,
- Biomechanical modelling.

VALUE PROPOSITION/OFFERING

The company has a high level of expertise in the development of industrial digital twins projects where the model numerical complexity can be completely hidden from the user. The company has identified multi-scale modelling applications as ones with the highest potential in the future. Taking into account the advantages of the symbolic development approach to multi-level modelling, the company has an excellent starting point for further participation in space-related projects.

REFERENCES IN SPACE INDUSTRY

- Modelling on micro thruster used in PRISMA mission (NanoSpace – SSC).
- ESA-SURE AO 021 (2006): In vivo biomechanical measurements of human skin properties under accelerated aging conditions during ISS mission (SKIN-B).
- ESA-PECS AO/1-7708/13/NL/KML: Inverse system for evaluation of biomechanical properties of human skin (BioInSys).
- ESA-RPA (2021): How to better utilise micro structures of new materials to improve space missions reliability (Micro-Mat4Space).

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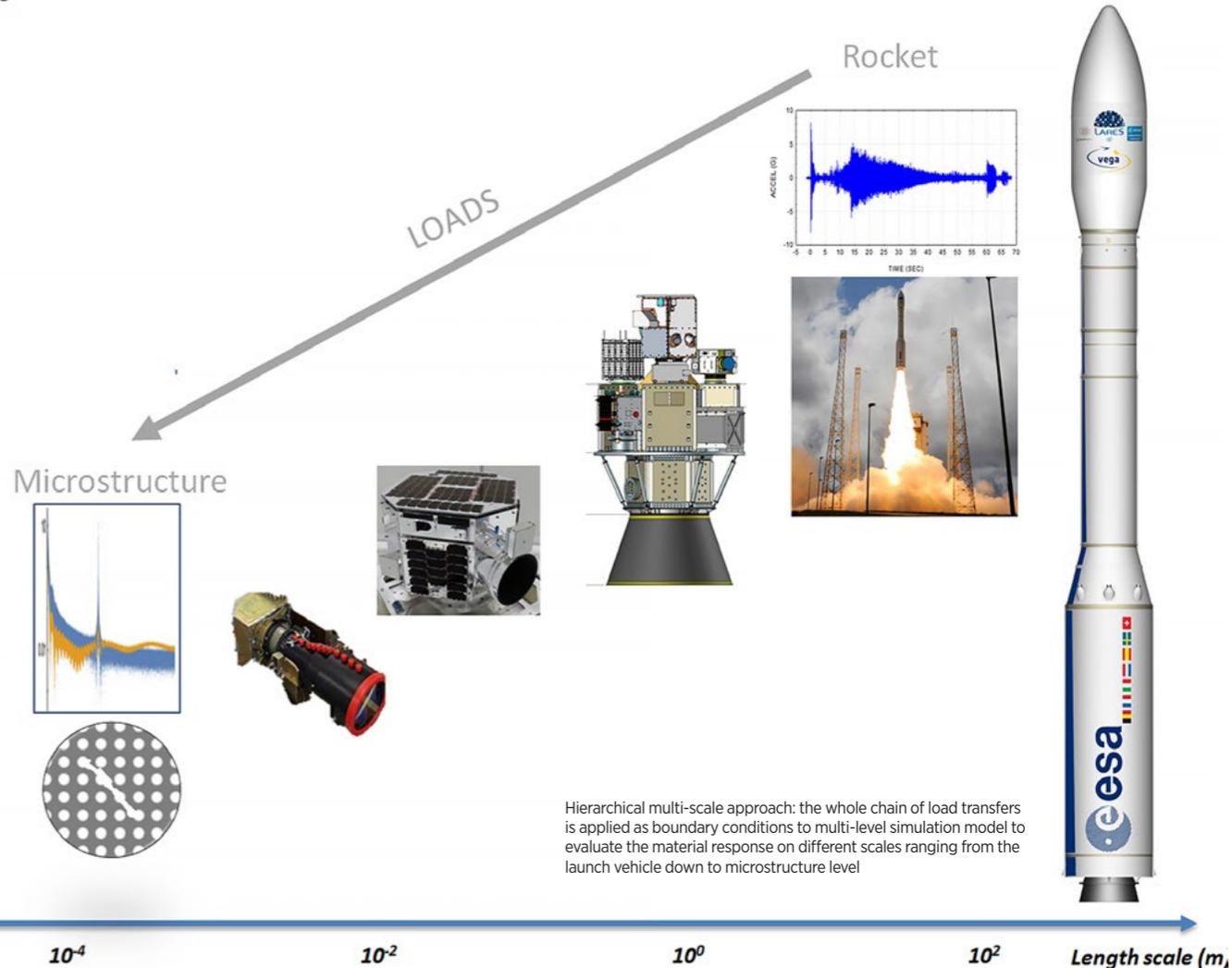
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Time scale



Hierarchical multi-scale approach: the whole chain of load transfers is applied as boundary conditions to multi-level simulation model to evaluate the material response on different scales ranging from the launch vehicle down to microstructure level

SHORT DESCRIPTION OF THE COMPANY

Comtrade 360 specialises in customised technology solutions designed to meet the needs of leading enterprise infrastructure and systems software providers worldwide. It also specialises in deploying internally developed cybersecurity tools and AI solutions in data and information management. An essential Comtrade 360 solution is high-performance storage software based on CERN EOS, also called the Coffsyter. The advantages of the Coffsyter are confirmed by the initial setup of expandable Comtrade 360 hardware, which currently differs only in size from the equipment at CERN for storing data from the Large Hadron Collider.

Comtrade 360's AI operates according to clearly defined principles for each AI/ML action based on the general OECD AI principles: inclusivity, human-centred values, transparency, safety and accountability. Current AI research at Comtrade 360 is focused on Anomaly Detection and Causality Analysis.

In general, Comtrade 360 has 30 years of expertise in high-end software development, resumed with the following current activities:

- Develop, support, and maintain a comprehensive suite of Citrix monitoring solutions for Microsoft Systems Center.
- Design and development of the world's most popular systems management solutions based on partnerships and services for products within the HP OpenView portfolio.
- Development for GRAU DATA: Hierarchical Storage Management and archiving storage data management areas for Linux and Windows platforms.

In 30 years, Comtrade has developed software for more than 2000 worldwide customers, including large companies such as Microsoft, Intel, and Oracle. The decision to join software development for the Space industry is based on Comtrade 360 experience in providing the world's top software solutions.

SPACE SEGMENTS THAT ARE MOST RELEVANT FOR YOUR COMPANY

All kinds of high-end reliable software storage solutions are needed for all space segments, especially for:

- Ground systems
- Space applications
- Earth observation
- Space exploration
- Space mining

VALUE PROPOSITION/OFFERING

Based on 30 years of expertise, we suggest providing software solutions as a service.

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High availability hardware at Comtrade 360 computer room in Ljubljana, including Comtrade Fast File System (CFFS) cluster (Coffsyter)

SHORT DESCRIPTION OF THE COMPANY

COSYLAB is an EU-headquartered engineering company with worldwide operations, employing 300+ people. Specialised in control systems software in various high-tech industries, COSYLAB has been collaborating with ESA and primes in the domain of software for support of space missions.

With vast engineering expertise, COSYLAB helps companies in the space sector establish their software systems faster in order to shorten time to market and lower business risk.

SPACE SEGMENTS THAT ARE MOST RELEVANT FOR YOUR COMPANY

- Ground systems
- Launchers
- Satellites
- Space applications
- Space exploration

MAIN ACTIVITIES/PRODUCTS/SERVICES RELEVANT FOR THE SPACE SECTOR

- Engineering services for EGSE development and system integration (Software & Electronics),
- Control systems engineering services for mission pre-launch and operations phases,
- ECSS-compliant project execution; expertise in space-specific communication protocols, space system data models preparation and editing, MCS software vertical column expertise, ground station system integration, AIT, etc.,
- Development of telescope and ground station systems software.

VALUE PROPOSITION/OFFERING

- Optimisation of end-product complexity, risk and cost from the very early stages of requirements engineering and design.
- Subject-matter experts from both space systems and software engineering.
- Delivery of complete documentation according to the required standards and processes.
- Worldwide support, remote and on-site, with the possibility to tap into a large pool of experienced engineers.
- Clients remain focused on their core business. Cosylab is responsible for timely delivery of software systems.
- Clients gain competitive advantage by shortening their time-to-market and by decreasing their business risk.
- Execution of large-scale projects (10+ person-years).

REFERENCES IN SPACE INDUSTRY

- Airbus Defence and Space: Development of system for remote control and diagnostics of the Optical Ground Station.
- OHB Italia: Cooperation in software system for FLYEYE – an extremely wide field of view telescope – developed for ESA and ASI as part of the Space Situational Awareness programme.
- ESA/ESOC: Integration of various communication bus technologies (MIL-STD-1553, CAN/CANopen, SpaceWire) into the EGS-CC for AIT use-cases.
- ESA/ESTEC: EGS-CC MVP consolidation activities and QA-system improvements.
- European Ground Segment - Common Core (ESA): end to end system validation.
- Development of essential space system modelling tools for ESA's new ground segment.
- ESA/ESOC: Development of the new generation user interface for operational monitoring and control applications.

COSYLAB d.d.

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Satellite in earth orbit with night-time Europe and Northern Africa beneath and the rising Sun in the background

SHORT DESCRIPTION OF THE COMPANY

DBS Engineering presents a new generation of state-of-the-art inflatable halls and wooden structures for sports, industrial, and other unique purposes. When developing and designing products, they prioritise energy efficiency in extreme climate conditions and the development of eco-membrane systems that enable the highest level of energy savings.

Through the years they developed many prominent air supported structures, including the biggest air dome in Eurasia, several innovative architectural air domes. These structures incorporate many systems that DBS pioneered and developed, such as the smart dome system, custom lighting solutions and innovative membrane applications.

They are extremely proud to have cooperated with companies involved in development of space settlements. A remarkable achievement and focus of the company are the development of technical fabrics, which can be used for construction of living habitats in space. Recently they had been involved in development of HVAC technology for closed eco-systems.

SPACE SEGMENTS THAT ARE MOST RELEVANT FOR YOUR COMPANY

- Ground systems
- Life in space
- Space settlement

MAIN ACTIVITIES/PRODUCTS/SERVICES RELEVANT FOR THE SPACE SECTOR

- Air-supported structures,
- Custom technical tensile membranes/fabrics,
- Development of technological solutions for life in space.

VALUE PROPOSITION/OFFERING

- Innovation in the field of air supported structures with more than 25 years of experience,
- More than 1000 realised projects and satisfied customers,
- Precision and outstanding quality,
- Advanced HVAC systems for space development projects,
- Completely custom air dome design and development,
- First-class 24/7 customer support.

DBS Engineering

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- 1 DBS Engineering team presenting their newest tensile membrane and HVAC technology at an international fair in Germany
- 2 Unique transparent dome installed and developed by DBS engineering, which was set up for a fashion show in Greenwich, London
- 3 Prototype air dome, which is a product of DBS Engineering's long term-space development division, exhibited at an international fair



SHORT DESCRIPTION OF THE COMPANY

Dewesoft is a leading provider of data acquisition (DAQ) and analysis solutions. It offers a variety of solutions for aerospace testing from standard data recording, structural dynamics, rotating machinery analysis and acoustic testing, to more specific applications like ground station telemetry solutions.

The distributed, rugged data acquisition hardware and flexible software matches requirements for spacecraft and satellites in the air, space, or on the ground – proving ground, wind tunnel, vibration shaker or acoustic chamber.

Dewesoft also supplies solutions for launchpad instrumentation and testing of components and engines, as well as experimental flight testing and satellite testing such as data recording, FFT analysis, power analysis, order tracking, balancing, modal testing, sine reduction, vibration analysis, fatigue analysis, or temperature-stress testing.

SPACE SEGMENTS THAT ARE MOST RELEVANT FOR YOUR COMPANY

- Ground systems
- Launchers
- Satellites
- All types of measurements done on space products and components

MAIN ACTIVITIES/PRODUCTS/SERVICES RELEVANT FOR THE SPACE SECTOR

SIRIUS data acquisition instruments – a versatile, powerful, high-dynamic USB and EtherCAT measurement system, which can connect with any signal and sensor. In addition, the data acquisition system combines high-end signal conditioning amplifiers and real-time EtherCAT data bus for low latency data output capability to 3rd party EtherCAT real-time controllers like Cyclone Clemessy, Labview, and others.

DewesoftX software – a software suite storing, analysing and visualising data from multiple sources like PCM, Chapter 10, iNET, ARINC 429, MIL-STD-1553 and in-depth vibration analysis of modal analysis, GVT and many other specialised software modules.

VALUE PROPOSITION/OFFERING

With proven performance and test records Dewesoft data acquisition systems are used in mission critical applications. Designed to be modular and extendable, our equipment is suited for testing and measurement in a wide range of applications and in all kinds of environments. All DAQ units come with a seven-year warranty and free lifetime software upgrades.

REFERENCES IN SPACE INDUSTRY

- ESA,
- NASA,
- DLR,
- SpaceX,
- Clemessy,
- Boeing,
- Virgin Galactic,
- and others.

Dewesoft d.o.o.

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🌐 www.dewesoft.com



 **DESIGNING TEST EQUIPMENT THAT SIMPLIFIES THE ADVANCEMENT OF HUMANITY.**

www.dewesoft.com

- 1 PCM telemetry unit and DAQ equipment for monitoring space objects
- 2 Rocket engine testing for Ariane 6 made with Dewesoft measuring and monitoring equipment with 2000 sensors integrated with SYCLONE controller (Clemessy)

SHORT DESCRIPTION OF THE COMPANY

Today DUOL company is the global leader in the air dome industry with more than 1,600 covered objects worldwide. With custom-designed air domes and frame structures meeting all local standards and requirements, DUOL has proven to be a valuable partner for any investor, with air dome applications ranging from sports, events & entertainment, to industry & warehousing, agriculture, military and space. As a result of several prominent references, rich experience, and a well-versed team, DUOL sees a bright future ahead due to the fact that air domes have become an ideal solution and a cheaper and faster alternative to conventional construction for covering any surface temporarily or permanently. To put simply, there is still a lot of ground to cover...

SPACE SEGMENTS THAT ARE MOST RELEVANT FOR YOUR COMPANY

- Ground systems
- Earth observation
- Space settlement (development phase)
- Life in space

MAIN ACTIVITIES/PRODUCTS/SERVICES RELEVANT FOR THE SPACE SECTOR

Design, manufacture and installation of radomes and other:

Sports construction engineering:

- Design, manufacture and installation of air domes & wooden/steel construction, covered with membrane.

Military, civil protection, lifeguard service and other terrain users:

- Modular pneumatic tents,
- Temporary shelters,
- Air domes.

Industrial production or storage halls:

- Temporary or permanent warehouses,
- Mobile and modular storage systems,
- Landfill AirDomes.

VALUE PROPOSITION/OFFERING

DUOL is a world-renowned company in the field of inflatable structures. Company maintains its leading position in the industry through cutting-edge state of the art solutions.

In recent years the company has also been pioneering in the Space programme, including inflatable radomes and inflatable Mars habitats.

REFERENCES IN SPACE INDUSTRY

- DUOL RADOMES – envelope protection with unsurpassed RF performance for antenna systems. It improves pointing and tracking accuracy and extends system operation time to 24/7 regardless of weather conditions.
- In 2020, in collaboration with partners, DUOL manufactured the inflated shell of the Mars habitat which was part of the Mars exhibition.

DUOL d.o.o.

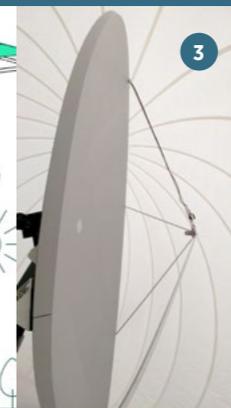
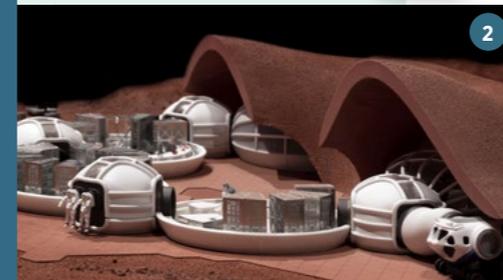
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👤 Gregor Rijavec,
Head of Global Partner Network

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🌐 www.duol.eu



1 DUOL provides the most sustainable air domes

2 Inflatible Mars habitat: One step closer to life on Mars

3 DUOL radome protects antenna systems while providing outstanding electromagnetic transmission performance throughout a broad range of frequencies

4 DUOL air domes can be custom-designed

5 First and largest airdome-covered velodrome in Europe

6 Radome – view from outside

SHORT DESCRIPTION OF THE COMPANY

ELEP Electronics is a small company active in the field of advanced radio communication technologies. Its strength is in an innovative R&D, proven expertise in the RF/microwave engineering and high-performance hardware development. ELEP actively participated in the first Slovenian microsatellite NEMO-HD mission (SPACE-SI, 2020). In addition, ELEP designed and manufactured a X-band high-speed data downlink transmitter payload for the NEMO-HD spacecraft, reaching the TRL9 in 2021. The company's focus are the advanced spacecraft communication (sub)systems and ground-segment satellite technology developments (SATCOM).

SPACE SEGMENTS THAT ARE MOST RELEVANT FOR YOUR COMPANY

- Spacecraft and launcher communication payloads
- Ground station systems
- Satellite communications
- Satellite developers and integrators

MAIN ACTIVITIES/PRODUCTS/SERVICES RELEVANT FOR THE SPACE SECTOR

- Communication devices in UHF, L, S, X and Ka-band (transmitters, receivers, converters),
- Custom communication solutions and related support systems,
- Antenna design and development,
- Ground station antenna autotrack dual-band feeds,
- RF hardware: S and X-band LNAs, synthesizers, level detectors, etc.

VALUE PROPOSITION/OFFERING

- Flight heritage and proven expertise: TRL9 achieved in 2021,
- Innovative and efficient hardware development,
- TRL9 RF (sub)systems,
- 20+ Years of RF, microwave and millimetre-wave developments.

REFERENCES IN SPACE INDUSTRY

- Space Flight Laboratory, University of Toronto (UTIAS), Canada and SPACE-SI, Slovenia – delivery of a X-band data transmitter payload (flight model) for the NEMO-HD mission.
- TRL9 achieved in May 2021 (X-band transmitter payload).
- SPACE-SI, Slovenia – delivery of a dual-band S+X-band autotrack feed for a 5.4m ground station antenna, in addition to various RF processing hardware (X-band downconverters, X-band LNAs, S-band downconverters, S-band LNAs, cavity filters, precision RF power detectors, UHF transmitter controllers, etc.).

ELEP ELECTRONICS

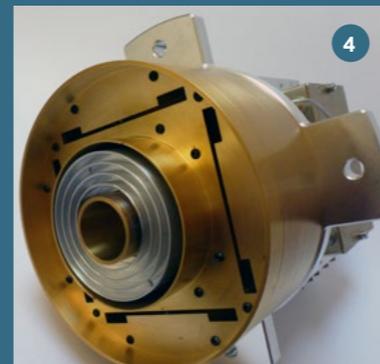
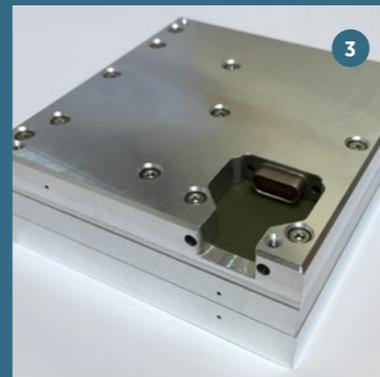
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1 ELEP ELECTRONICS achieved the first flight heritage in 2021 with its X-band data transmitter payload on-board the first Slovenian microsatellite NEMO-HD (SPACE-SI, 2020). This TRL9 payload continues to deliver the data to the Earth after more than two years of in-orbit operation.

2 The ELEP ELECTRONICS X-band data transmitter payload (TRL9, 2021) integrated in the flat-sat of the first Slovenian microsatellite NEMO-HD (SPACE-SI, 2020)

3 The ELEP ELECTRONICS second generation X-band data transmitter payload capable of up-to 200Mbit/s data rate features a compact size that fits to the nanosatellite class

4 ELEP ELECTRONICS designs and manufactures also advanced ground-station RF systems, such as the shown autotrack dual-band S+X-band feed for the parabolic-mirror antennas used in most LEO ground stations

SHORT DESCRIPTION OF THE COMPANY

The Addiblast® smart solution series is the latest user-friendly line of machines from FerroČrtalič, a company boasting over 55 years of tradition, continuous development and a drive for excellence, which is an indispensable surface treatment partner to various industries such as aeronautical, medical, automotive, foundry, and more. The family of new machines follows Industry 4.0 guidelines and includes state-of-the-art automated solutions regardless of the material used. The goal is to achieve the immediate usefulness of 3D-printed parts in practice. Alongside it accelerates AM production process and enabling it for serial production with time, cost and labour optimisation.

SPACE SEGMENTS THAT ARE MOST RELEVANT FOR YOUR COMPANY

- Launchers
- Rockets
- Flight propulsion systems
- Engines

MAIN ACTIVITIES/PRODUCTS/SERVICES RELEVANT FOR THE SPACE SECTOR

Addiblast® provides answers to the extraordinary growth of the additive manufacturing industry also known as 3D printing. It presents new guidelines and requirements in the field of post processing such as de-powdering, powder collection & recycling and surface treatment of unconventional structures and materials. The required post-processing depends on the requirements and printing method of the manufactured part. The processes most commonly used after printing are depowdering, removal of support structures, surface treatment, and hardening. In this respect, Addiblast® post-processing solutions bring together 3 key post-processing solutions within the same product line: depowdering, powder recovery, and surface treatment of 3D-printed parts, whether made from plastic or metal. Complete product line is designed to accept AM printed parts from all major world wide OEM's of 3D printers.

VALUE PROPOSITION/OFFERING

Additive Manufacturing is widely used in space industry where companies are already working to 3D print an entire rocket, including fuselage, engines, and fuel tanks. AM is increasingly being used for complex rocket engine parts. Huge benefit of AM in space industry is also reduction of part count using design freedom of additive technology compared to traditional manufacturing methods. Addiblast® plays crucial role in supporting the industry achieving their goals on time with fast, repeatable and cost-effective post processing solutions.

REFERENCES IN SPACE INDUSTRY

- Rocket propulsion manufacturer
- Space flight service provider
- Rocket/Satellite launching provider

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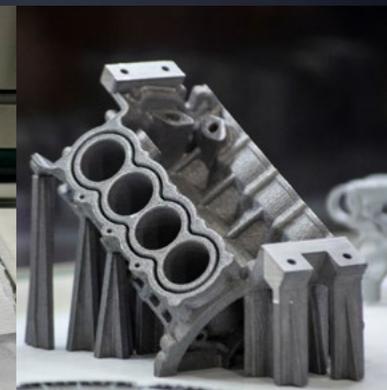
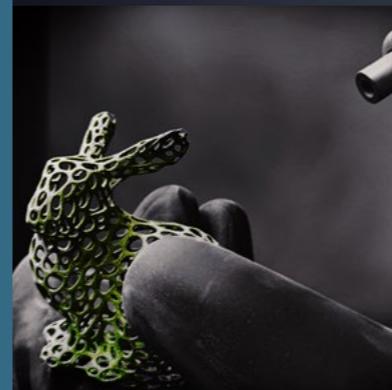
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Half a century of experience and knowledge
for the **3D-industry** of the future.

Post processing, **redefined.**





SHORT DESCRIPTION OF THE COMPANY

Flai was founded in 2022, with a mission to automate the extraction of custom user-driven products from Earth observation datasets by deploying state-of-the-art Artificial Intelligence (AI) solutions. Our main focus is the analysis and classification of LiDAR point cloud data. Generated products can be used for general large-scale LiDAR mapping surveys, power-line monitoring, forestry inventory production, infrastructure asset mapping, digital elevation model creation and many other applications.

SPACE SEGMENTS THAT ARE MOST RELEVANT FOR YOUR COMPANY

- Satellites
- Space applications
- Space observation

MAIN ACTIVITIES/PRODUCTS/SERVICES RELEVANT TO THE SPACE SECTOR

Flai web application:

- Intuitive browser for point cloud, raster and vector datasets,
- Point cloud annotation tool for manual classification,
- Running custom workflows for the production of usable end products,
- Making ready-to-use ai solutions available to everyone,
- Retraining our ai models for user-specific requirements,
- Scalable operations depending on customer needs.

Research activities:

- Data analysis and generation of comprehensive training sets,
- Development of ai models,
- Usage of machine learning for the development of the customised earth observation services.

VALUE PROPOSITION/OFFERING

We are one of the first companies in the world to offer customisable automatic processing of LiDAR point clouds and imagery. Such automatic processes decrease the need for currently common manual annotation work, speeding processing times and saving time and money!

Flai d.o.o.

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👤 Luka Rojs

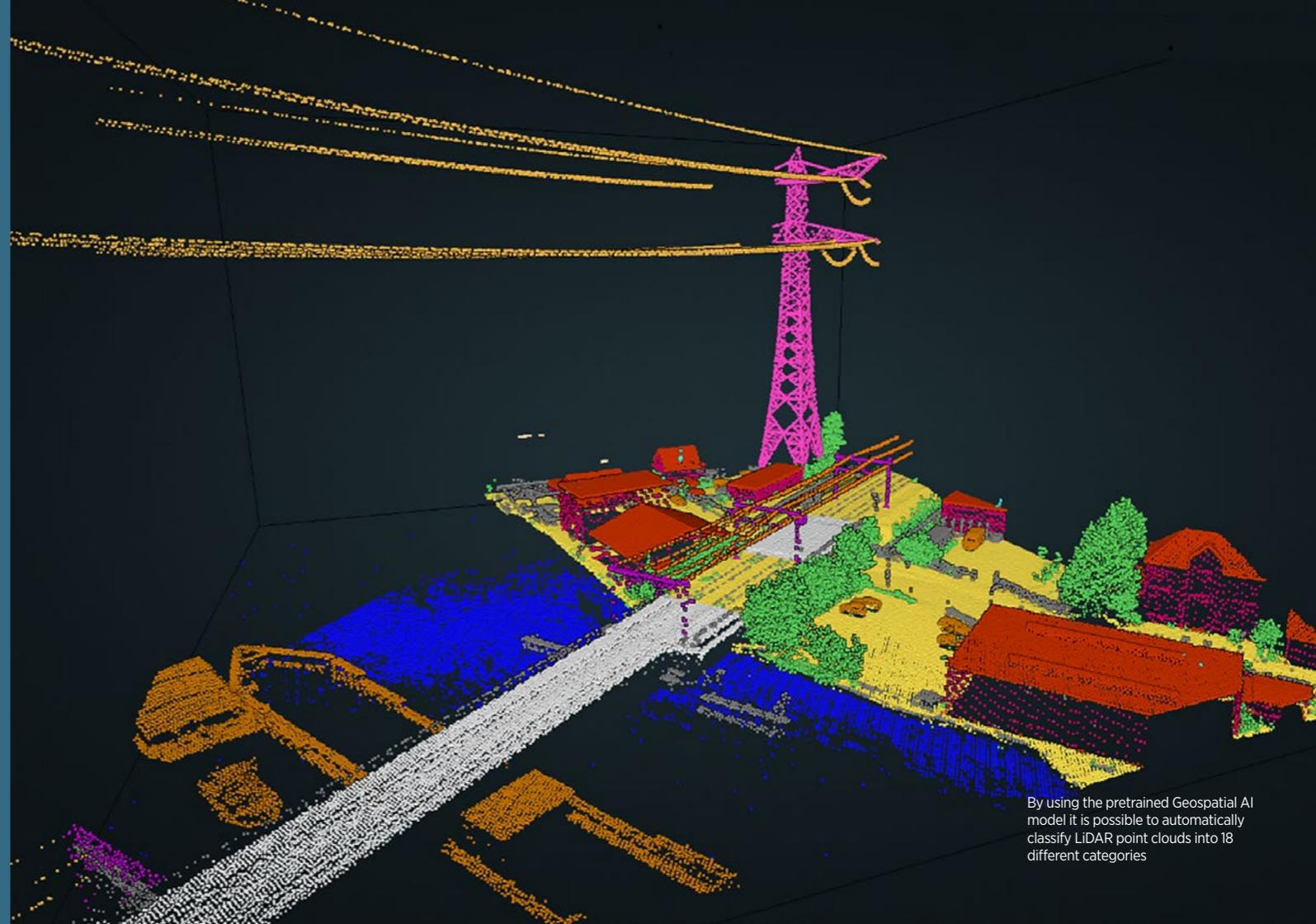
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Flai Robot – Artifact



By using the pretrained Geospatial AI model it is possible to automatically classify LiDAR point clouds into 18 different categories

SHORT DESCRIPTION OF THE COMPANY

Flycom Technologies has been industry's leading provider of airborne and mobile remote sensing data acquisition, processing and data management services for more than 15 years. It provides highly accurate spatial data – LiDAR point cloud and derived products, photogrammetric products, thermal (IR) and UV imaging, asset mapping, Space Born EO data – to various governmental and private entities in Slovenia and abroad.

The company has its' own geographic information system "LIFT" that enhances spatial data management and visualisation by enabling fast and easy way of accessing, editing, and exchanging information across different organisations. LIFT is used in industry sectors where spatial data is a key component of the business processes – energy management, insurance, public safety, telecommunications, and government.

Flycom's long-term goal is to strengthen its role as a key player in the field of remote sensing and to become a leading regional player in the location intelligence segment.

SPACE SEGMENTS THAT ARE MOST RELEVANT FOR YOUR COMPANY

- Space applications
- Earth observations

MAIN ACTIVITIES/PRODUCTS/SERVICES RELEVANT FOR THE SPACE SECTOR

Location intelligence (LIFT):

- LIFT's Natural Hazard Module is a solution intended for the (re)insurance industry, with the key purpose of detecting different types of natural hazards.

Remote sensing services:

- Aerial and mobile remote sensing data acquisition (LiDAR, photogrammetry, thermal and UV imaging), processing, and management services (inventory management).

VALUE PROPOSITION/OFFERING

Location intelligence (LIFT):

- Natural Hazards Module – once geospatial data becomes available, it is instantly imported and analysed, saving clients' time and money.
- The possibility of customised integrations and development in accordance with the customer's needs.

Remote sensing services:

- High technological level of equipment.
- Optimal performance of aerial operations due to modern equipment and the ownership of aircrafts.
- Highly accurate geospatial data that enable further analysis according to client needs.
- A wide range of remote sensing services and products (classified and RGB point cloud, digital terrain models, digital surface models, true orthophoto, oblique orthophoto, 3D mesh, 360° panoramic images, IR, UV and visual inspections etc.).

REFERENCES IN SPACE INDUSTRY

- Copernicus Accelerator – company of the month (Y2019)
- Copernicus Incubation – winners with our Natural Hazards Module (Y2020)
- Providing remote sensing services and products in more than 20 countries in Europe and Africa

Flycom Technologies d.o.o.

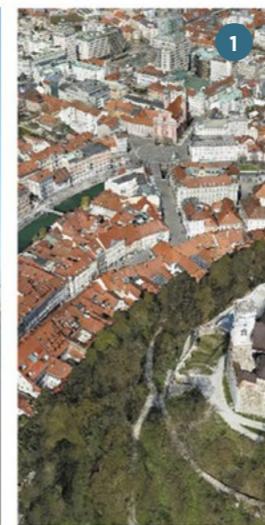
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1 A collage of four photographs. Top left aerial spatial data acquisition aircraft, top right oblique orthophoto of Ljubljana Castle and part of the city centre, bottom left orthophoto of the urban part of the city with feature labels, and bottom right vehicle with mobile spatial data acquisition equipment.



2

2 An aerial data acquisition aircraft, with a stream of laser beams scanning the surface on the underside of the image.



SHORT DESCRIPTION OF THE COMPANY

GeoCodis Information Systems is a private company specialised in software development in the field of remote sensing, water management, GIS and mobile network industry solutions. GeoCodis Ltd. developed a visualisation and analysis portal focused on surface water and flood areas utilising data gathered from Sentinel-1A. Results of the radar satellite image analyses are integrated into the final portal www.vodakje.si which is used daily by the Slovenian Environmental Agency. GeoCodis was involved in the ESA-founded Customised Earth Observation Services project. Several EO services for built-up areas and water bodies inside the user-defined area of interest were developed for serving World Bank needs in Sub-Saharan Africa countries. GeoCodis developed a prototype system MLEO for the creation of machine-learning data samples and analysing satellite images using a machine-learning approach.

SPACE SEGMENTS THAT ARE MOST RELEVANT FOR YOUR COMPANY

- Earth observation
- Space applications

MAIN ACTIVITIES/PRODUCTS/SERVICES RELEVANT FOR THE SPACE SECTOR

- Development of customised earth observation services,
- Integration of earth observation products to business applications,
- Development of high value products based on spatial analytics and artificial intelligence.

VALUE PROPOSITION/OFFERING

GeoCodis offers professional and high-value customer-based applications and integration services. Our team also has experience in working with customers from different countries including in the Middle East, Africa and Asia.

REFERENCES IN SPACE INDUSTRY

- WhereIsWater.at and VodaKje.si portals, public sector in Slovenia.
- Customised Earth Observation Information Services, European Space Agency.
- Integration of EO into the UPMIS Water Management system in Uganda, European Space Agency.
- Quality of Services for mobile phone industry, A1 Slovenia, A1 Serbia.
- Different water-management-related applications developed for public and government institutions in Uganda, Rwanda and Kenya.
- Open Machine Learning for Earth Observation (ML4EO) in Rwanda.

GeoCodis, information systems Ltd.

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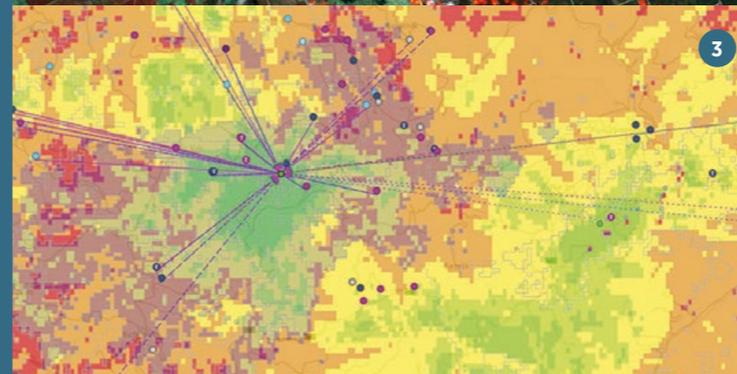
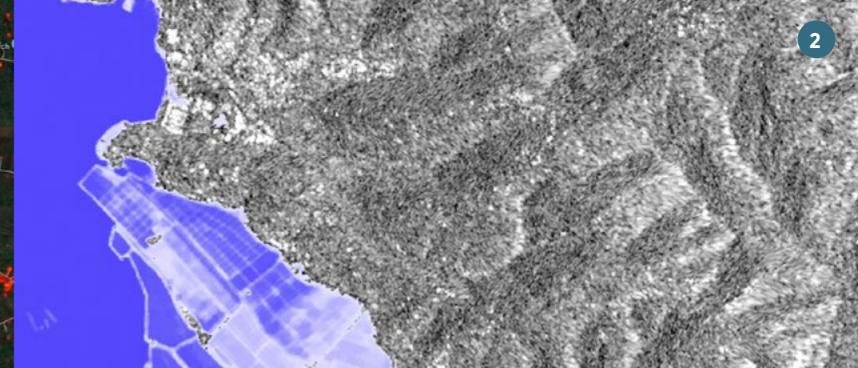
1 Screenshot of application for Settlement Detection in Uganda

2 Screenshot of application for water detection

3 Screenshot of application for mobile phone industry

4 Screenshot of application for Water Detection

5 African family on the way to fetch water





GUARDIARIS

Train The Brain.

SHORT DESCRIPTION OF THE COMPANY

Guardiaris is company specialised in the production of custom-designed indoor and outdoor simulators for civilian and military sectors. Simulators range from driving simulators to trainers and simulators for training of small arms, anti-tank and missile systems. Entire vehicle crews and infantry platoons can be trained simultaneously in joint computer-generated battlefield. Key product for civilian market is the Driver's Response Analytics System (DRAS) based on eye tracking solution. It is a perfect tool assisting in new and existing motorway infrastructure planning, presenting the new perspective in the world of virtual driving simulators and motorway infrastructure planning.

Guardiaris boasts its own proprietary synthetic computer simulation software registered under the GUARD trademark. GUARD simulation environment is one of the most advanced products on the market that features real-time rendering of highly realistic terrains and environments, weather and time-of-day simulation, use of advanced AI, simulation of vehicle dynamics and dynamic terrain changing, while providing seamless integration with digital twins. Unique patented laserless solution ensures flexible training with comprehensive data collection and management in real-time for excellent assessment and precise after-action review. Performance evaluation and the consequent adaptation of the training plan are extremely effective via Guardiaris' analytics and reports software. Guardiaris also provides its customers with full autonomy in rapid scenario creation and customisation results for unmatched mission-specific realism.

Guardiaris acts as OEM partner to some of the world's largest corporations and as a direct supplier to a growing number of armies worldwide. They use Guardiaris solutions for various forms of skill-acquisition training.

Guardiaris adheres to ISO 9001, AQAP 2110, AS 9100 standards.

SPACE SEGMENTS THAT ARE MOST RELEVANT FOR YOUR COMPANY

- Ground systems
- Space applications
- Space settlement

MAIN ACTIVITIES/PRODUCTS/SERVICES RELEVANT FOR THE SPACE SECTOR

Offering the complete cycle of image import from various formats (e.g. photo, LIDAR, radar, open) and sources (satellite, aerial, land) and fusing them into high quality 3D model. 3D model becomes part of the synthetic computer generated environment. Ideal for what-if, use cases analyses on existing of planned infrastructures. On Earth, Moon, or Mars.

VALUE PROPOSITION/OFFERING

- Guardiaris products are well-known by their: modular design, portability, real-life digital twins and replicas, cost-effectiveness, and advanced training analytics,
- Sensor image fusion from multiple sources into 3d synthetic computer generated environment,
- Integration with existing digital twins or development of new ones,
- Customisation of graphics engine for specific requirements.

REFERENCES IN SPACE INDUSTRY

Missile simulator for Ministry of Defence.

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www.guardiaris.com



1-2 Detailed geography, environment model from earth to clouds based on real data or synthetically computer generated.

3-4 Digital model of future road infrastructure inserted within 3D digital elevated map geography.



SHORT DESCRIPTION OF THE COMPANY

Ineor is a world leading international software development company providing global, complete, and advanced software development services and breakthrough key innovative digital solutions for multinational companies, usually the world champions in their field of operation. Risk-management solutions, business AI, new mobility, energy management, industrial software, healthcare, e-government solutions, financial applications, online and land-based gaming platforms, are just some of the industry sectors we provide for with our top digital solutions.

SPACE SEGMENTS THAT ARE MOST RELEVANT FOR YOUR COMPANY

- Ground systems
- Space applications
- Space exploration
- Space mining

MAIN ACTIVITIES / PRODUCTS / SERVICES RELEVANT FOR THE SPACE SECTOR

Ineor provides complete software development for your digital needs leaving no room for errors. Our state-of-the-art solutions provide digitization and automation by introducing and supporting advanced algorithms, combining Internet of Things and edge computing with machine learning and artificial intelligence.

With our custom approach to your specific needs, we can transform your operations, processes, and business, giving you more time and more control and enabling you to concentrate on your core knowledge and solutions, realizing your full potential and making you a world champion.

With Space Risks, Ineor provides the space industry with a complete risk management solution that is changing the way the risks are detected, analysed, understood and pro-actively managed.

Such high-end, reliable solutions are needed in all segments of space programs, especially for: maintenance and operations, support, planning, training, and ground systems, research and industrialization, exploration, and various future applications such as long-distance space travel and mining.

Space is a risky business, and you can place your trust in us to turn these risks into opportunities.

VALUE PROPOSITION / OFFERING

We have developed numerous digital transformation solutions for leading world companies and our promise stays the same: our unwavering commitment to our customers. Our solutions measurably improve operational excellence, streamline, and improve processes, reduce risks, and make businesses not only more agile, but also more resilient.

We may adapt as our customers and their needs change, but our mission stays the same: we always deliver on time, on budget, and with zero bugs!

REFERENCES IN SPACE INDUSTRY

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SHORT DESCRIPTION OF THE COMPANY

Since 1998 we have been providing innovative high-speed DAQ solutions for various industries. The solutions include complete R&D and production services of:

- Tailored electrical HW and embedded SW designs satisfying most demanding requirements,
- EMC and certification assistance,
- Mid-series production for our clients.

Our core competencies lie in DAQ electronic circuit and system design (RF signal processing, low noise, and low-power designs, pure analogue designs, mixed-signal designs on single PCB), FPGA programming, vanilla embedded and Linux development, digital signal processing, fast data transfer, clock synchronisation, and timing signal stabilisation.

In 2013 we introduced to the market the first open-source, precise multifunction measurement tool, called Red Pitaya, which has become the de facto standard in Space Prototyping stages and testing.

SPACE SEGMENTS THAT ARE MOST RELEVANT FOR YOUR COMPANY

- Ground systems
- Life in space
- Satellites
- Space applications
- Earth observation
- Space exploration

MAIN ACTIVITIES/PRODUCTS/SERVICES RELEVANT FOR THE SPACE SECTOR

- Development of customised high-speed multi-channel DAQ solutions based on existing ruggedised building blocks (control unit electronics, equipment for diagnostics of various parameters),
- Red Pitaya's STEMLab devices for rapid prototyping of new designs or testing purposes.

VALUE PROPOSITION/OFFERING

We help our customers to:

- Expedite time to market by using our know-how and competences in complex electronics design,
- Cut development costs by providing solutions based on already field-proven building blocks,
- Focus on their core business by eliminating the burden of detailed technical implementation.

REFERENCES IN SPACE INDUSTRY

NASA Jet Propulsion Laboratory, Thales Alenia Space, BAE Systems, Boeing, Lockheed Martin, Raytheon, Safran.

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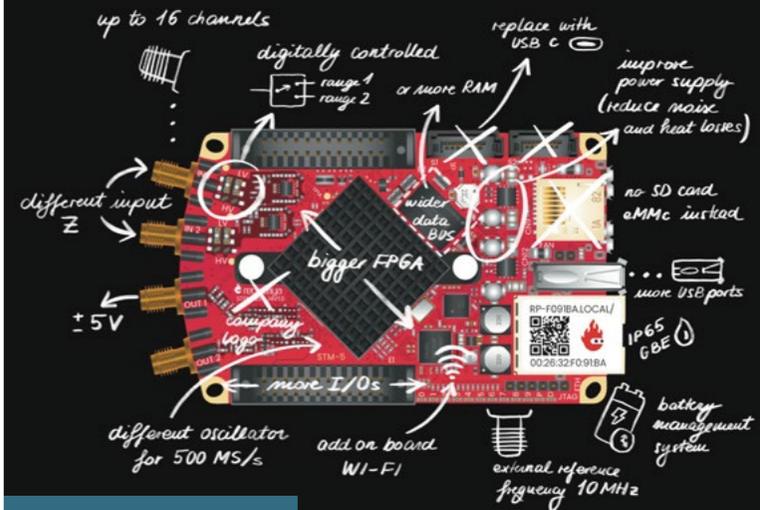


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3

4



- 1 LIBERA Brilliance + instrument
- 2 LIBERA Digit 500 instrument
- 3 LIBERA Spark instrument
- 4 Customization possibilities on Red Pitaya

SHORT DESCRIPTION OF THE COMPANY

With over 125 highly qualified staff members and following the latest environmental and technological standards, our products have become an indispensable element of new technology final products.

Intectiv's strategy is primarily based on the development and modernization of technology to produce HDI boards and prototypes. Our main advantages are high-tech production and expertise, continuous improvement and development, as well as flawless support to the customers with fast and quality production.

New standards are being set with a high level of development and technologically innovative solutions, thus moving the limits of the possible and therefore encouraging the progress of electronic and electrical industry of highly demanding european markets.

SPACE SEGMENTS THAT ARE MOST RELEVANT FOR YOUR COMPANY

- Ground systems
- Launchers
- Earth observation
- Satellites
- Space applications

MAIN ACTIVITIES / PRODUCTS / SERVICES RELEVANT FOR THE SPACE SECTOR

Printed circuit boards (PCB).

VALUEPROPOSITION / OFFERING

High quality, short lead time, wide technical range.

REFERENCES IN SPACE INDUSTRY

Communication and observation applications (satellite- Earth), high-frequency PCBs.

Intectiv d.o.o.

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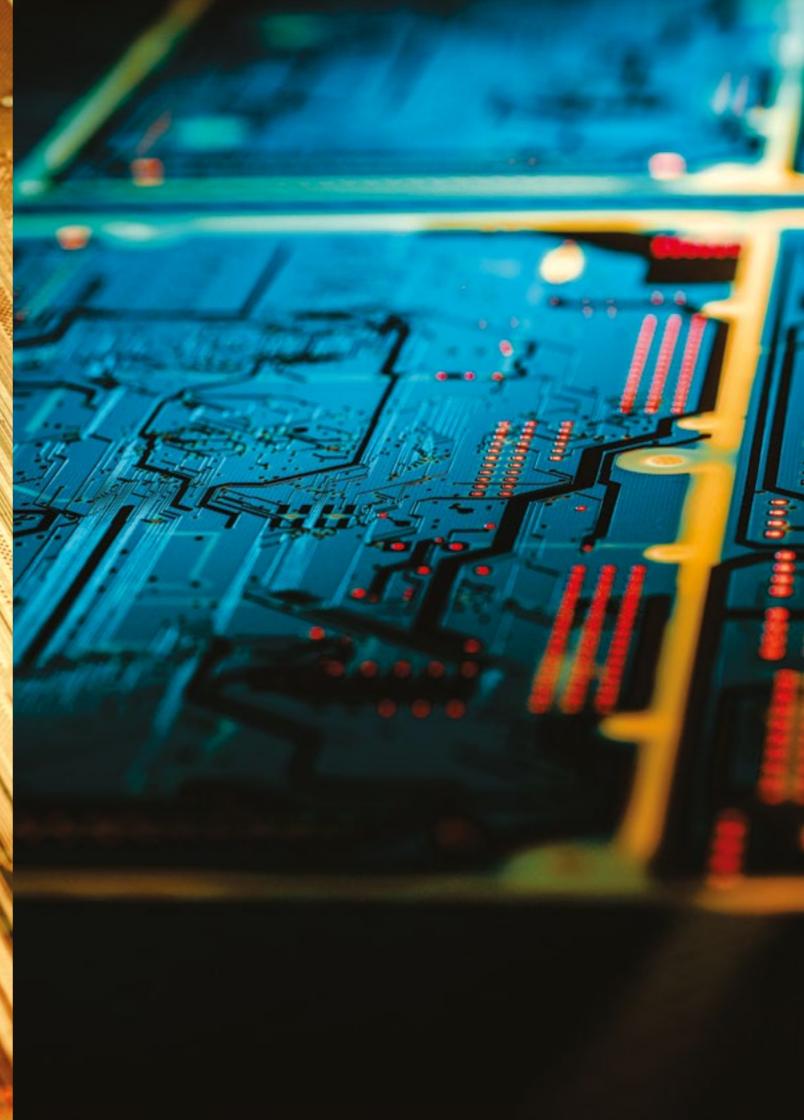
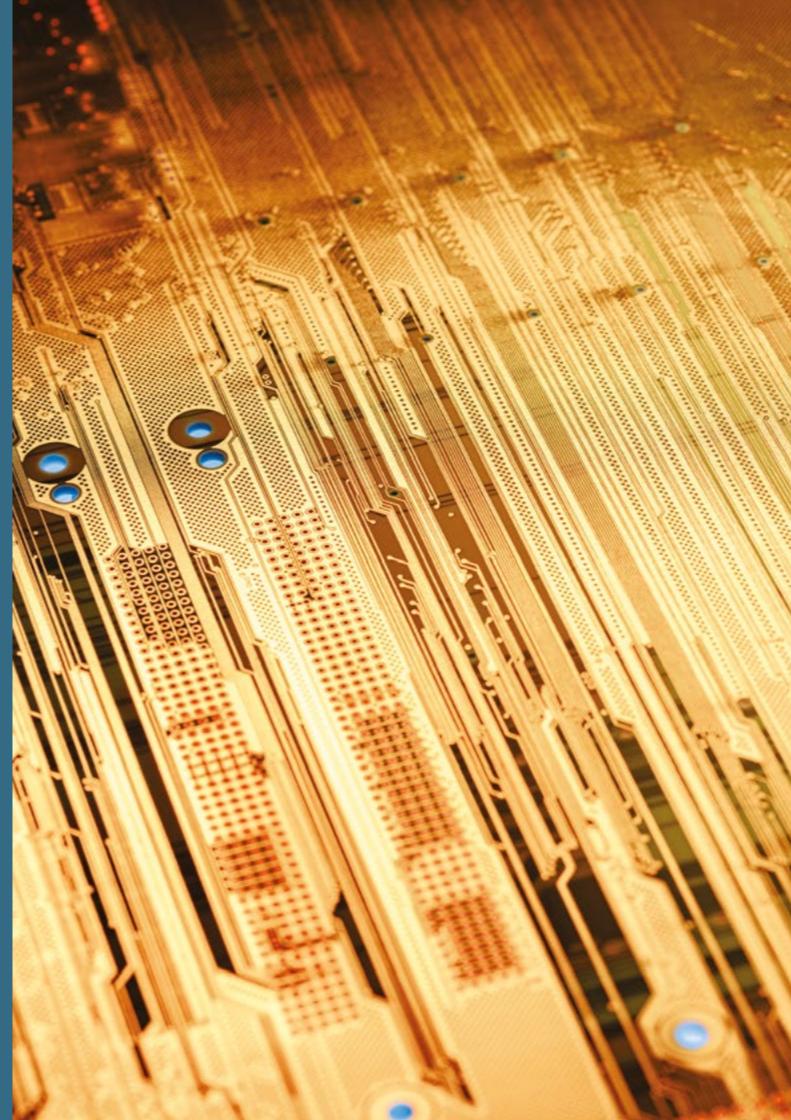
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🌐 www.intectiv.si



SHORT DESCRIPTION OF THE COMPANY

IRNAS is a custom hardware development company based in Maribor, Slovenia. With its largely cross-disciplinary in-house expertise they are developing end-to-end hardware solutions in the fields of IoT, space connectivity and wireless optical communication. With their rich network of technological partners and in-house production capabilities, they are staying ahead of competition in hardware development. Their palette of customers located worldwide comprises companies of different sizes, from start-ups to multinational corporations from different sectors.

SPACE SEGMENTS THAT ARE MOST RELEVANT FOR YOUR COMPANY

- Ground Systems
- Space applications

MAIN ACTIVITIES/PRODUCTS/SERVICES RELEVANT FOR THE SPACE SECTOR

- Hardware development,
- Embedded software development,
- Prototyping,
- Software development,
- Systems integration,
- Automated testing,
- Wireless optical communication development.

VALUE PROPOSITION/OFFERING

A company with a proven track record of fast-paced agile end-to-end hardware solution development. Combining our agile development process with in-house production facilities and automated testing infrastructure we are a one-stop provider for development and delivery of bespoke hardware products.

REFERENCES IN SPACE INDUSTRY

- Satellite-connected IoT solutions across all continents.
- Technological partnerships with major space connectivity providers.

IRNAS d.o.o.

📍 Limbuška cesta 76b,
2000 Maribor, Slovenia

📧 Luka Mustafa

☎ +386 31 597 271

✉ info@irnas.eu

🌐 www.irnas.eu



2

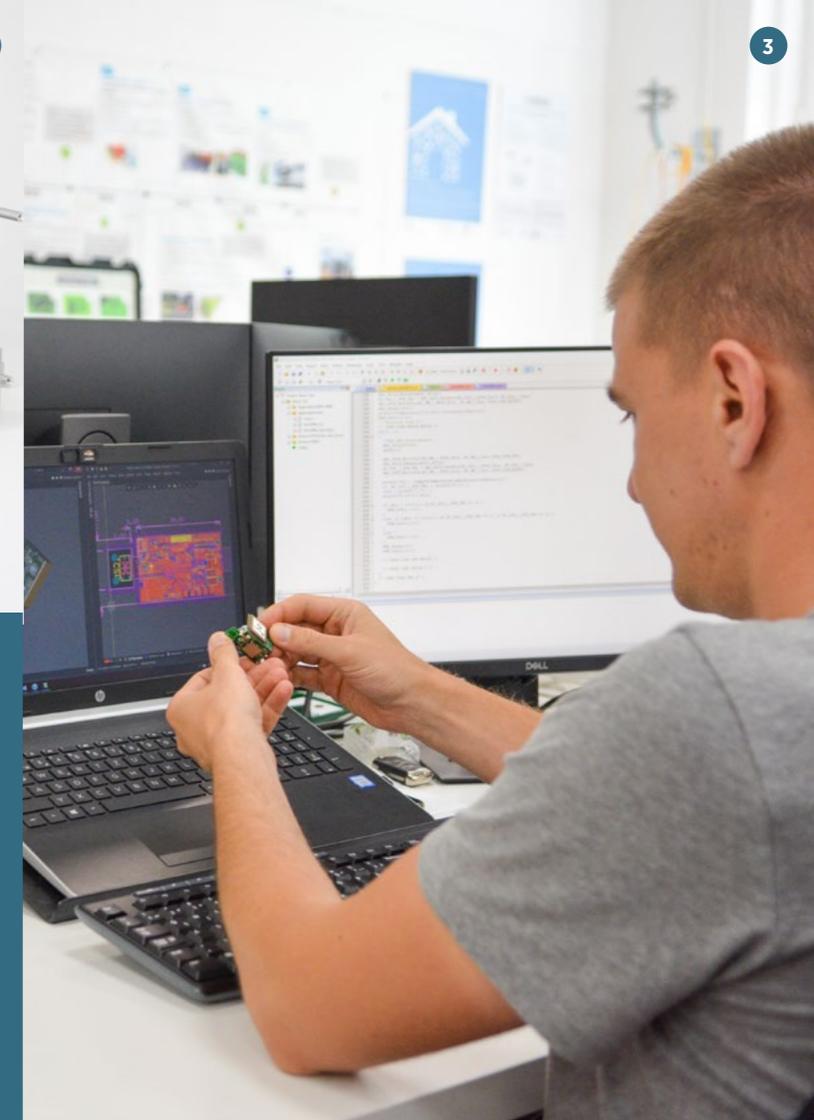


1

1 IRNAS d.o.o. premises located in Maribor, with offices and production & assembly facilities

2 A disassembled unit of KORUZA wireless optical communication system – a technology developed by IRNAS that is now integrated in a variety of end-solutions

3 A developer using PCB design software designing an electronic device



3



SHORT DESCRIPTION OF THE COMPANY

Our company produces samples and prototypes and provides the composition of small, medium and large (up to several thousand pieces) series of electronic circuits. Custom-made final products can also be assembled. SMT and THT technology is used with an addition of manual soldering and own development.

SPACE SEGMENTS THAT ARE MOST RELEVANT FOR YOUR COMPANY

- Ground systems
- Launchers
- Space applications

MAIN ACTIVITIES/PRODUCTS/SERVICES RELEVANT FOR THE SPACE SECTOR

- Prototyping,
- Producing prototypes,
- Assembly of pcb boards,
- Manufacturing electronic devices with state-of-the-art technology.

VALUE PROPOSITION/OFFERING

High quality and rapid response. We respond to technological challenges and provide custom-made assembly of PCB boards.

As a company with many years of experience, reliability, stability, and professionalism we wish to continue offering the production and development of quality electronic circuits for high-tech devices of the future.

REFERENCES IN SPACE INDUSTRY

- Producing electronic devices for FAIR, Germany.
- Producing photon detectors for accelerator SuperKekB in Bellell, Japan.
- Producing different electronic equipment for different accelerators as a partner in projects with multiple companies involved.
- Producing navigation instruments for ultralight planes.

KENS electronics d.o.o.

Tovarniška cesta 8a,
3312 Prebold, Slovenia

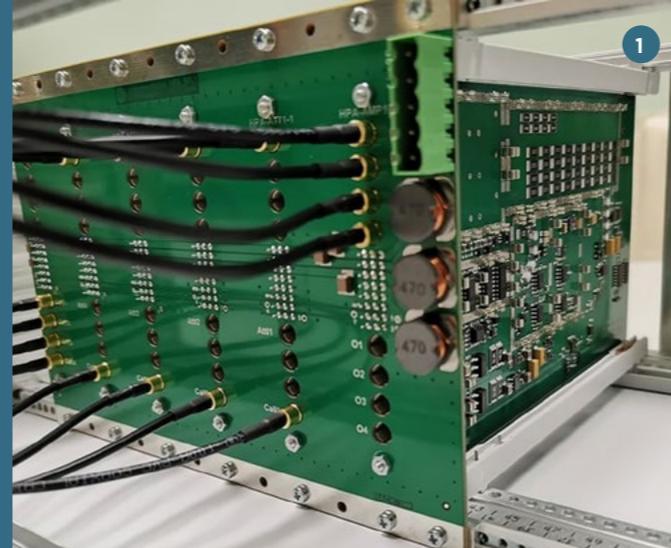
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anzej.hvala@kens.si

www.kens.si/en/



- 1 Amplifier HPA for accelerator
- 2 Control device for testing cable harness
- 3 Navigation instrument for glider
- 4 Photon detector ARICH in Japan
- 5 Prototype 1





SHORT DESCRIPTION OF THE COMPANY

LE-TEHNIKA is a family-owned SME engaged in cryocooler development and production. In addition, the company is present in the field of LED street lighting and manufacturing of hydraulic systems.

With more than 30 years of experience in cryogenic sector we have become experts of miniature Joule-Thomson and Stirling cryocoolers designed for cooling infrared detectors. Other applications include cooling of high temperature superconducting magnets and cold traps for gas impurities. Our core expertise includes cryocooler development and production, while we have also capabilities for their integration into dewar-detector assemblies and other complex systems. We are operating in more than 15 countries worldwide. Le-Tehnika offers premium specialised Joule-Thomson and Stirling coolers made to order. Apart from serial production, our flexible production enables production of samples or small series, always delivering high-quality coolers at affordable prices. Joule-Thomson coolers we are offering include self-controlled, fixed orifice, actively controlled, fast cool down and various nonstandard coolers, while Stirling coolers we are offering are possible with linear or rotary motor in integral or split configuration.

SPACE SEGMENTS THAT ARE MOST RELEVANT FOR YOUR COMPANY

- Earth observation
- Generic Technologies and Techniques

MAIN ACTIVITIES/PRODUCTS/SERVICES RELEVANT FOR THE SPACE SECTOR

Miniature Stirling cryocoolers for CubeSats or other use.

VALUE PROPOSITION/OFFERING

Experts in cryogenic coolers for temperatures down to 65K. Experience in development and manufacturing of serial production and customised cryocoolers and cryostats. Stirling coolers manufactured by Le-Tehnika are known for their good quality and reasonable price.

REFERENCES IN SPACE INDUSTRY

- GSTP project (2021/22)

LE-TEHNIKA d.o.o.

📍 Šuceva ulica 27, 4000 Kranj, Slovenia

👤 Franc Megušar

📞 +386 4 202 0280

✉️ cryogenics@le-tehnika.si

🌐 www.cryocoolers.eu/



- 1 Miniature rotary Stirling cryocoolers with cooling powers from 0.25W to 1W at 77K
- 2 Integral rotary Stirling cryocooler with cooling power of 0.5W at 77K
- 3 Actively controlled JT cryocooler for independent use or combined application with other type of coolers

SHORT DESCRIPTION OF THE COMPANY

Magneti Ljubljana is a European manufacturer of permanent metallic magnets, polymer bonded magnets and magnetic systems with a long tradition, since 1951.

Magneti Ljubljana is a development and market oriented company characterised by financial stability and business success. Through innovation and business excellence, company Magneti continues to fulfil our customers' demands and aim to create a working environment that encourages the development of our employees and the company as a whole in a sustainable and responsible manner.

Company's vision is to become a global manufacturer of permanent magnets and to become a trusted partner in the space industry with a focus on development of technologically advanced products and processes.

SPACE SEGMENTS THAT ARE MOST RELEVANT FOR YOUR COMPANY

- Permanent magnets in various applications for space sector,
- Metallic magnets (SmCo, AlNiCo, sintered NdFeB magnets), plastic bonded magnets and filament for 3D printing of bonded magnets,
- Special alloys for hydrogen storage.

MAIN ACTIVITIES/PRODUCTS/SERVICES RELEVANT FOR THE SPACE SECTOR

- Permanent metallic magnets in applications for the space sector. For products such as traveling wave tubes, electric motors, hall effect devices, couplers, actuators, spectrometers and sensors etc...

VALUE PROPOSITION/OFFERING

- Production of permanent magnets in Europe/Slovenia,
- Possibility for direct re-using EoL or scrap magnets in production,
- Own development, patented filament for 3D printing of bonded magnets.

MAGNETI LJUBLJANA D.D.

📍 Stegne 37, 1000 Ljubljana, Slovenia

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🌐 www.magneti.si



Different permanent magnets and systems made by Magneti Ljubljana d.d.

SHORT DESCRIPTION OF THE COMPANY

MARSi Group offers high quality services in fields of 3D metal print, CNC machining, 3D metrology, Research & Development, consulting and technical support in the field of revolutionary technologies.

MARSi Group has developed chain of services to meet the highest demands of customers while developing and producing high quality products, that cannot be produced with conventional technologies. Our AM system and process parameters are fully compliant with 3D printing standards, ensuring optimum and high-quality smart manufacturing. We offer complete production of individualised products, with a wide range of suitable materials for the aerospace industry which meet the stringent requirements. Together, we can achieve your requirements and goals in the areas of production, development and design.

SPACE SEGMENTS THAT ARE MOST RELEVANT FOR YOUR COMPANY

- Satellites
- Launchers
- Ground systems
- Space applications

MAIN ACTIVITIES/PRODUCTS/SERVICES RELEVANT FOR THE SPACE SECTOR

- Additive manufacturing of complex metal parts with DMLS® technology & HQ materials such as: Nickel Alloy 625 (W.Nr. 2.4856); Stainless Steel 316L (W.Nr. 1.4404); Aluminium Alloy AlSi10Mg.
- Depending on your needs for small or medium series production, we can introduce and certify new materials in our AM system that will meet your application.
- CNC machining of metals and other materials on 5-axis CNC milling machine. With our machining services we can also post-process of complex additively manufactured parts.
- 3D metrology services with GOM ScanCobot (ZEISS) & ATOS Q which is suited for efficient quality control of small and medium-sized parts made of plastic, metal or cast iron.
- R&D services: Topology-optimisation, simulation and additive manufacturing of extremely stable lightweight individualised parts for space crafts.

VALUE PROPOSITION/OFFERING

MARSi's vision is to develop and modernise manufacturing processes using 3D metal printed parts with DMLS® technology. We are offering fast and efficient manufacturing of finished 3D printed metal parts in different applications.

Our added value is that we can offer you other 'smart' services under one roof, such as 5-axis CNC milling and 3D metrology services. The aforementioned services can be offered individually or as part of a package, i.e. from 3D printing, post-processing to quality control.

REFERENCES IN SPACE INDUSTRY

- Manufacturing of complex cost-efficient parts for satellites.
- Manufacturing of topology optimised lightweight combustion chamber for rocket engine.

MARSi group d.o.o.

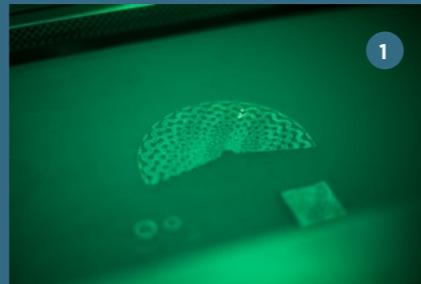
📍 Slovenska vas 4K,
8261 Jesenice na Dolenjskem, Slovenia

👤 Mario Šinko, CEO

☎ +386 8 205 8693

✉ info@marsi.at

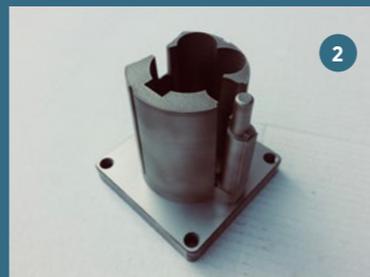
🌐 www.marsi.at



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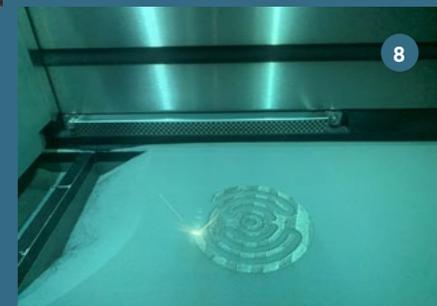
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3



6



8

- 1 3D metal print, DMLS Technology
- 2 3D metal print, DMLS Technology
- 3 MARSi-3D metrology
- 4 3D metal print, DMLS Technology
- 5 MARSi-3D metal print, DMLS Technology
- 6 Topology optimised reducers
- 7 Prototype of exhaust manifold
- 8 DMLS process

SHORT DESCRIPTION OF THE COMPANY

Paradigma Technologies d.o.o. is a Slovenian enterprise operating in the New Space industry and specialising in high-frequency radio solutions. We are developing and producing the most modern mmWave telecommunication systems for small satellites, cubesats, drones and SOTM. The company Paradigma Technologies d.o.o. was founded in 2019. Since its establishment, the focus of the team is to develop and produce reliable communication devices that can be used in space. We provide innovative and reliable solutions focused on improving performance and energy efficiency, with reduced dimensions and weight.

SPACE SEGMENTS THAT ARE MOST RELEVANT FOR YOUR COMPANY

Satellites:

- mmWave 5G NR receivers,
- Cubesat and Smallsat missions.

Ground systems:

- SATCOM on-the-move terminals,
- UAVs and drones.

MAIN ACTIVITIES/PRODUCTS/SERVICES RELEVANT FOR THE SPACE SECTOR

Products:

- K Band Transmitter is a highly integrated and efficient solution for small satellites,
- Ka Band Receiver with UHF transceiver is a highly integrated, versatile, and efficient solution for small satellites, 5G and SOTM terminals,
- Q Band Transmitter is a strategic product of the company, as we anticipate that its utility value will increase significantly due to the trends related to connected technologies,
- KA Band Transponder is a miniaturised plug & play solution for Cubesats and small satellites, specifically designed for high reliability and radiation tolerance.

Services:

- Hardware: end-to-end design of analogy and digital systems from low to mmwave frequencies,
- Industrialisation: functional and investments definition, supply chain, planning, production, and testing.

Research:

- Feasibility, analysis of new technologies, concept, and prototype.

VALUE PROPOSITION/OFFERING

Our line of mmWave radios offers:

- Higher frequency – more bandwidth,
- Suitable also for Nanosats (>10kg),
- Lower power consumption,
- Lower cost.

REFERENCES IN SPACE INDUSTRY

- Our Ka band receiver and K band Transmitter are under qualification for IOD (in orbit demonstration).
- Ka Band Transponder and Q Band Transmitter Suitable for LEO and GEO missions, it offers a high gain dual band corrugated horn antenna.

PARADIGMA TECHNOLOGIES d.o.o.

📍 Kraška ulica 2, 6210 Sežana, Slovenia

👤 Andrej Volpi, CEO
Igor Kriznar, CBO
Milena A. Đukić,
Marketing and Public Relations Manager

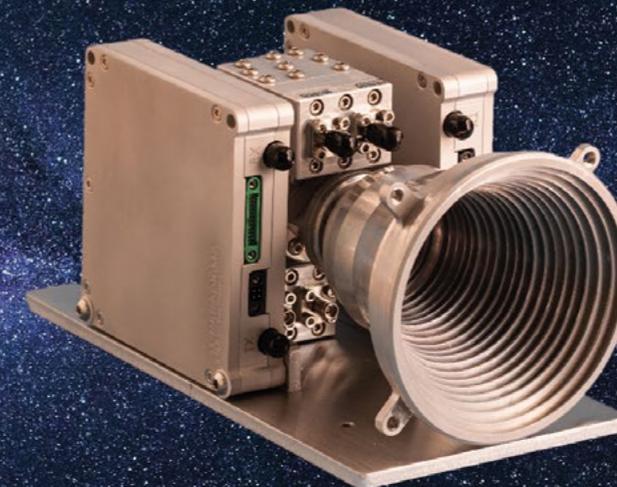
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igor.kriznar@paradigma-tech.com
milena.andelic@paradigma-tech.com

🌐 www.paradigma-tech.com



1



2

- 1 K Band Transmitter and Ka Band Receiver. Efficient solution for small satellites and SOTM terminals, specifically designed for low size, mass and power consumption.
- 2 Highly integrated, versatile, and efficient solution for Cubesats and small satellites

SHORT DESCRIPTION OF THE COMPANY

RIEDL AEROSPACE d.o.o. produces precise, high-quality machined metal parts and assemblies for aerospace industry.

The basic goal of the company is to satisfy the needs of individual customers and even to exceed their expectations, which are founded on the quality of the product and services.

Our desire is a steady and continual growth with the expansion of the company's recognisability on the international market. In doing so, we are establishing long-term relations with our business partners and employees.

We are committed to achieving the highest quality standards in everything we do. We have established the management system to meet the requirements of the international quality standards according to ISO 9001: 2015, and the environmental management standards according to ISO 14001: 2015.

The vision of the RIEDL GROUP is to be the best Slovenian company in the field of mechanical metal machining with an important share of our own research and construction.

SPACE SEGMENTS THAT ARE MOST RELEVANT FOR YOUR COMPANY

- Satellites
- Space applications
- Ground systems

MAIN ACTIVITIES/PRODUCTS/SERVICES RELEVANT FOR THE SPACE SECTOR

- Cnc turning,
- Cnc milling,
- Assembly,
- Cnc sheet metal bending,
- Laser cutting,
- Research & development.

VALUE PROPOSITION/OFFERING

- Precision and quality,
- High responsiveness,
- Flexibility,
- Individual approach,
- Long-term experiences.

REFERENCES IN SPACE INDUSTRY

- Enpulsion
- SkyLabs
- Magna Aerospace
- FACC (Bombardier, Airbus, Boeing)

RIEDL AEROSPACE d.o.o.

Preradovičeva ulica 42,
2000 Maribor, Slovenia

Tomaž Riedl, CEO

+386 2 300 0501

riedl@riedl.si

www.riedl.si

- 1 Table mechanism for private jets – interior part
- 2 Hinge mechanism for private jets – interior part
- 3 Apparatus for measuring the turbine blades
- 4 Device for measuring the turbine blades
- 5 Nano satellite body
- 6 Ion thruster parts – satellite
- 7 Mounting bracket for private jets – interior part
- 8 Bar end – satellite part
- 9 Reinforced seat belt mount for private jets – interior part



3



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9

SHORT DESCRIPTION OF THE COMPANY

SIJ Metal Ravne with its 1,000 employees and almost 80,000-ton annual production belongs to the group of mini mills at the global level. We produce a rich pallet of more than 200 steel grades in different dimensional shapes, from carbon and alloyed structural steels to tool and special steels in the form of rolled and forged products.

SPACE SEGMENTS THAT ARE MOST RELEVANT FOR YOUR COMPANY

We produce special steels and process Ni and Ti alloys that can be used for various purposes.

MAIN ACTIVITIES/PRODUCTS/SERVICES RELEVANT FOR THE SPACE SECTOR

- Production and ingot casting of special steel grades like SINOXX, VOD, highly demanding structural steels, tool and high-speedsteels,
- Advanced production technology of special steels like VOD (Vacuum Oxygen Decarburisation) method, ESR (Electroslag Remelting) method,
- Forging, rolling and machining of stainless and special steels, Nickel and Titanium alloys,
- Performing in house NDT quality control and Metallurgical tests,
- Strong research and development team, that can offer customer all needed support or be leading partner at developing new products or even new steel/alloy grades.

VALUE PROPOSITION/OFFERING

Quality System Management:

- EN/AS 9100,
- ISO 14001,
- OHSAS 18001,
- ISO/IEC 17025,
- Cooperation with companies active in the aerospace industry,
- Own heat treatment furnaces,
- Experience with forging/rolling and heat treatment of nickel and titanium alloys.

Control and Testing of Material

- with own metallurgical research, we foster development of new products and improvement of technologies together with our customers,
- we advise customers as to which steel is best for their applications.

REFERENCES IN SPACE INDUSTRY

- 400 years of tradition,
- Own metallurgical research,
- Strong own development,
- For the most challenging conditions we use VOD (Vacuum Oxygen Decarburisation) and ESR (Electroslag Remelting) methods.

SIJ METAL RAVNE D.O.O.

📍 Koroška cesta 14,
2390 Ravne na Koroškem, Slovenia

👤 Brigita Rataj,
Head of Marketing Department

📞 +386 2 870 7000
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✉ marketing@metalravne.com
brigita.rataj@metalravne.com

🌐 <https://sij.metalravne.com/en/>



1 Premium quality steel bars produced in SIJ Metal Ravne

2 Quality control for high-performance and ultimate safety materials which perform exceptionally at all times

SHORT DESCRIPTION OF THE COMPANY

Sinergise is an SME with extensive expertise in developing advanced geospatial information systems based on cloud and web technology, focusing on areas where it can have the greatest impact: Earth observation, making it easier for individuals, institutions, and value-adders to get actionable insights into what is happening with our planet; supporting IT processes in agriculture that ensure more efficient use of resources while ensuring ecosystem sustainability; and land administration processes that are essential for government transparency and economic growth.

SPACE SEGMENTS THAT ARE MOST RELEVANT FOR YOUR COMPANY

- Earth observation

MAIN ACTIVITIES/PRODUCTS/SERVICES RELEVANT FOR THE SPACE SECTOR

- **Sentinel Hub** – an award-winning satellite imagery archiving, processing and distribution service – powers EO applications around the world, processes hundreds of millions of requests each month, crunching more than 50 PB of data from Sentinel, Landsat, PlanetScope, SkySat, Pleiades, SPOT, WorldView and other missions,
- **Monitoring** – machine-learning assisted extraction of information from EO data for proactive monitoring of state of the land (identification of agriculture activities, new building constructions, etc.).

VALUE PROPOSITION/OFFERING

Sinergise's vision is to facilitate the vast amounts of available EO imagery to be used in people's everyday lives. By partnering with AWS, they have brought the open Copernicus Sentinel data to the cloud and made it accessible to everyone. Hundreds of thousands of people use it to monitor wildfires, environmental disasters, Amazon rainforest deforestation, find new penguin colonies in Antarctica, and even to find missing hikers. The next step in their journey is an automated, continuous monitoring of our planet, shuffling through dozens TB of data that become available every day to extract relevant information. These include Blue Dot Water Observatory, which monitors more than 15,000 water bodies globally, uses machine learning (ML) to extract the extent of water and shows the worrying impacts of global warming. They are using Batch processing to create ML-ready features to demonstrate cost-efficient low-scale analysis, combined with drill-down methods and fusing data from non-EO sources. ML is also used to ensure agricultural sustainability. Along the way, Sinergise shares its experiences on the blog, posts open-source tools on GitHub, and engages the community to do similar things.

REFERENCES IN SPACE INDUSTRY

European Space Agency, European Commission:

- DIAS-es (CreoDIAS, Mundi Web Services, ONDA), WEKEO, CODE-DE
- EO Browser
- Euro Data Cube
- Query Planet
- Digital Twin of News

NASA, Geoscience Australia:

- Sentinel-1 CARD4L tool
- European Environmental Agency, Joint Research Centre:
- Sentinel-2 Global Mosaic, part of Copernicus Land Monitoring Services

Sinergise d.o.o.

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🌐 www.sinergise.com
www.sentinel-hub.com



Sinergise's Sentinel Hub – an award-winning satellite imagery archiving, processing and distribution service – powers EO applications around the world. It processes hundreds of millions of requests every month and handles more than 50 PB of data from Sentinel, Landsat, PlanetScope, SkySat, Pleiades, SPOT, WorldView and other missions.



SHORT DESCRIPTION OF THE COMPANY

SkyLabs is a space-technology oriented company providing miniaturised satellite platforms, EGSE and innovative approach to space engineering. SkyLabs is providing high-tech solutions and services for the most demanding aerospace and terrestrial applications.

SPACE SEGMENTS THAT ARE MOST RELEVANT FOR YOUR COMPANY

- Satellites
- Space applications
- Space exploration

MAIN ACTIVITIES/PRODUCTS/SERVICES RELEVANT FOR THE SPACE SECTOR

Miniaturised satellite platforms with complete EGSE represent comprehensive turn-key solutions for micro and small-scale satellite constellations.

Semiconductors design expertise is leveraged in innovative radiation protection techniques, ICs and radiation sensors.

VALUE PROPOSITION/OFFERING

SkyLabs provides innovative solutions by following the latest technology trends with a proactive and creative design approach, without sacrificing reliability nor performance.

REFERENCES IN SPACE INDUSTRY

SkyLabs platform and equipment on-board of:

- EAGLET-2 EO satellite constellation mission based on OHB Italia M3 Platform
- SAT4EO constellation mission, prime Elecnor Deimos Group
- HEREMS-TP/SP/SPiRIT scientific constellation mission, prime INAF
- TRISAT IoD satellite mission – demonstrating SkyLabs key technologies, prime UM
- TRISAT-R technological pathfinder for Space Weather, prime UM
- TRISAT-S IoD satellite mission – demonstrating management of a secure link, prime UM

SkyLabs d.o.o.

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2000 Maribor, Slovenia

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🌐 www.skylabs.si

Microelectronics & IP cores

On-board computers

SWIR spectroscopy

Earth ground station equipment

Electrical power systems

Communications

Embedded software with FDIR

In-orbit Demonstration in LEO and MEO

Remote terminal units

Scalable systems

Modular equipment

Future space explorations

Space weather

Our products and areas of work and research: Satellite avionics platform for micro- to small-scale satellites. On-board computers, Earth ground station equipment, Electrical power system, Communication subsystems, Remote terminal units, Embedded software with FDIR, Space weather, Microelectronics & IP cores, SWIR spectroscopy, SARA - autonomous low-cost arachnid all-terrain crawler, nanosatellites TRISAT (In-orbit demonstration of our products in Low Earth orbit) and TRISAT-R (In-orbit demonstration of our products in mid-Earth orbit).



Leader in innovative turnkey satellite avionics systems



SHORT DESCRIPTION OF THE COMPANY

SPACE-SI is specialised in the development and applications of microsatellite technologies. It has developed the first Slovenian microsatellite mission NEMO-HD, transportable ground station STREAM and processing chain for Earth Observation data STORM. SPACE-SI is provider of satellite video and multispectral images from space and operates three ground stations in Slovenia for UHF, S and X band satellite communications. The centre is equipped for thermomechanical testing and integration of materials, components, and space systems.

SPACE SEGMENTS THAT ARE MOST RELEVANT FOR YOUR COMPANY

- Ground systems
- Satellites
- Space applications
- Earth observation

MAIN ACTIVITIES/PRODUCTS/SERVICES RELEVANT FOR THE SPACE SECTOR

Small satellite mission design and operation (NEMO-HD):

- Video and multispectral imaging for low latency and real time Earth Observation,
- Agile and precise tracking of stationary scenes and Earth Observation paths.

Ground station development and operation (STREAM):

- Transportable ground station for S, X, Ka/Ku bands,
- Autotrack and feed technologies.

Earth Observation Data Processing and Applications (STORM):

- Video analytics for environmental and economic indicators,
- Monitoring of natural disasters, river basins, ports, etc.

Testing and integration of materials, components and systems:

- Thermomechanical testing in TVAC,
- Nanoindentation of materials.

VALUE PROPOSITION/OFFERING

SPACE-SI develops NewSpace products and services from satellite and ground segment components to the complete end-to-end solutions for advanced space missions.

REFERENCES IN SPACE INDUSTRY

Many national and international research projects and space missions for ESA, European Commission, Slovenian Research Agency as well as NEMO-HD, STREAM and STORM systems.

SPACE-SI Slovenian Centre of Excellence for Space Sciences and Technologies

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📧 Tomaž Rodič

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🌐 www.space.si/en/



Satellite



Ground
Station



Video &
Multispectral
Images



Satellite, Ground Station
and Video & Multispectral
Images by Space-SI



SHORT DESCRIPTION OF THE COMPANY

STN is a leading global teleport facility which provides satellite, broadcast, connectivity, and co-location services.

Located in a strategic area of Slovenia presents the company with a wide visible arc allowing easy access to all major satellite orbital positions.

With one of the world's most highly developed internet infrastructure, STN Slovenia has virtually unlimited capacities with complete double or triple redundancy/diversity options.

SPACE SEGMENTS THAT ARE MOST RELEVANT FOR YOUR COMPANY

- Ground infrastructure for antennas in various bands
- Ground systems/Connectivity
- Satellite Uplink/Downlink/Monitoring/TT&C

MAIN ACTIVITIES/PRODUCTS/SERVICES RELEVANT FOR THE SPACE SECTOR

Satellite:

With Satellite, fibre, and IP connections we provide end-to-end, managed service communication solutions worldwide. STN has PoPs in all major Data Centres in Europe and is also connected with fibre networks spanning worldwide.

TT&C:

Providing satellite operators the space for hosting their TT&C antenna(s). Secure, controlled site access, redundant & diverse fibre network, skilled personnel, and tools for the whole or part of TT&C installation with the option for office space if required.

Server Room/Rack Space:

Equipment hosting in a secured and temperature-controlled server room. A continuous power supply is ensured with fixed power, UPS, and a diesel generator for backup.

Available Ground Space:

Additional available land space to install new antennas, including gateways for new LEO or MEO projects.

VALUE PROPOSITION/OFFERING

The company was built on a flexible and open technical infrastructure, which allows the company to evolve further as industry trends and technology dictate.

REFERENCES IN SPACE INDUSTRY

- Eutelsat
- SES
- Intelsat
- Avanti PLC
- ST Engineering
- ASC
- Level 3 Communications
- Amazon Web Services (AWS)
- Cisco
- and many more space and technology industry leaders

STN STORITVE d.o.o.

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Viktorija Debevec

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🌐 www.stn.eu



1 STN Headquarters

2 STN Teleport

3 EQ/Data Center



SHORT DESCRIPTION OF THE COMPANY

A software company with strong research and a worldwide product portfolio.
AI and HPC tools.
3D analyses and segmentation in GIS and medical.
Low-bandwidth high-availability remote desktop.

SPACE SEGMENTS THAT ARE MOST RELEVANT FOR YOUR COMPANY

- Space applications
- Space mining
- Earth observation
- Life in space

MAIN ACTIVITIES/PRODUCTS/SERVICES RELEVANT FOR THE SPACE SECTOR

- Large scale deployments of computing power, remote maintenance and management of computers,
- EO with segmentation and AI,
- 3D visualisation and segmentation for space debris detection and forecasting,
- Remote desktop control in high-latency networks.

VALUE PROPOSITION/OFFERING

Providing simple solutions to complex software problems utilising ample brain power.

REFERENCES IN SPACE INDUSTRY

Products in use by general public across industries, worldwide. Please consult dedicated websites.

XLAB d.o.o.

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🌐 www.xlab.si
www.medicimaging.com
www.islonline.com



- 1 IT automation with Ansible provides optimisation and reliability
- 2 GIS modelling, planning and forecasting tool, vital in public safety
- 3 3D visualisation and surgical planning tool for dentistry and orthopedics

SHORT DESCRIPTION OF THE COMPANY

Zlatarna Celje d.o.o. is a long-time manufacturer of jewellery, dental alloys and industrial semi products from precious metals. As such, it has a long history of commercial success and an established market brand and market share in its region of operation in south-eastern Europe. Its core technological activity is the processing of noble metals and alloys, from producing finished products from raw materials to the refining of scrap noble metals. Its research and development is related to Nanotechnology, where it pioneers in synthesising gold nanoparticles for various purposes.

SPACE SEGMENTS THAT ARE MOST RELEVANT FOR YOUR COMPANY

- Satellites
- Space applications
- Earth observation
- Space exploration

For Zlatarna Celje, the launch of gold nanoparticles in those areas that can take advantage of their different properties and present new applications and, thus, expand operations, is of key importance to the gold nanoparticle production sector. This refers to the use of gold nanoparticles in nano-ink satellites that can be used to make circuits and other electronic components. Special attention should also be paid in the accompanying industries such as: Sensors and diagnostics in space, where gold nanoparticle-based inks are gaining a crucial role due to their biological properties.

MAIN ACTIVITIES/PRODUCTS/SERVICES RELEVANT FOR THE SPACE SECTOR

- Gilding,
- Synthesis of nanoparticles,
- Preparation of nano inks,
- Research and development activities.

VALUE PROPOSITION/OFFERING

Zlatarna Celje d.o.o. declares:

- that it can perform complex gilding, together with the necessary characterisation at the level of nano dimensions,
- that it is able to produce gold nanoparticles of different concentrations in the desired suspensions with different stabilisers, as well as gold nanoparticles in dry form with suitable cryostabilisers in different forms (such as cakes placed in appropriate packaging – myron glass).

REFERENCES IN SPACE INDUSTRY

1. RUDOLF, MAJERIČ. DOI: 10.14743/apem2020.3.371
2. MAJERIČ, RUDOLF. DOI: 10.1088/2053-1591/ab80ea

Zlatarna Celje d.o.o.

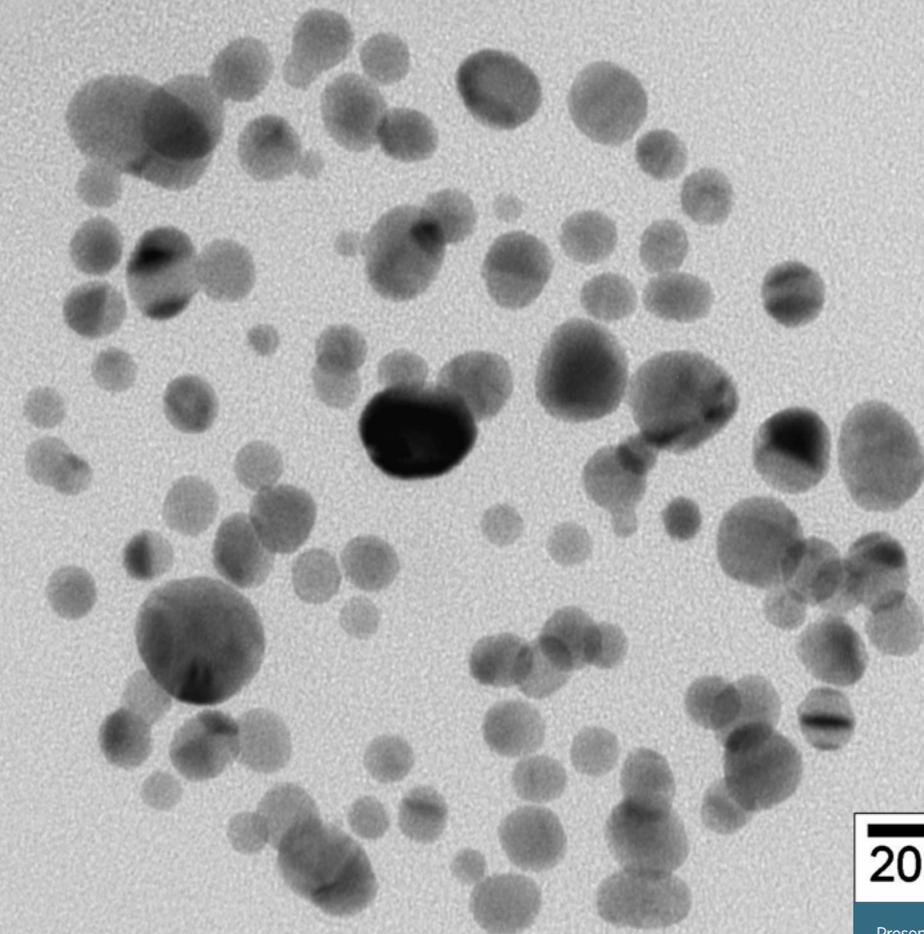
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20 nm

Presentation
of gold
nanoparticles



ŽustAl

SHORT DESCRIPTION OF THE COMPANY

ŽustAl d.o.o. is a modern, family-owned company situated in Žiri, Slovenia. Founded in 1996, it has grown into a successful business in CNC technology and welding throughout Slovenia and abroad. We have 3 and 5 – axis CNC milling machines.

With years of experience, high-quality work and traditional values, the company has established strong business relations by constantly adjusting to the modern market.

We specialise in the milling and welding of special materials such as Stainless steel, Duplex, Titanium, Inconel alloys, ARMCO® Pure Iron, Hastelloy, Aluminium 7075 and other materials.

Maintaining only high-quality production standards, we are constantly developing and creating long lasting growth opportunities.

Through recent years we have established many solid partnerships with other leading companies, specialising in CNC turning, grinding, water jet cutting, laser cutting and other techniques. All this makes it possible for us to take care of your projects, from the initial plan to the final product. Our firm is ISO 9001:2015 certified and our welders are certified for TIG and MIG/MAG welding in Standard SIST EN ISO 9606-2:2005 and SIST EN ISO 9606-1:2018.

Some of our references are:

- Science Industry (CERN, Kyma d.o.o., ASG Superconductors S.p.A.)
- Space industry (AIRWORKS S.r.l., Skylabs d.o.o.)
- Automotive industry (Kolektor d.o.o.)
- Hydropower industry (Tinck inženiring d.o.o.)

SPACE SEGMENTS THAT ARE MOST RELEVANT FOR YOUR COMPANY

- Space applications
- Satellites (structures)
- Launchers
- Space exploration
- Space mining

MAIN ACTIVITIES/PRODUCTS/SERVICES RELEVANT FOR THE SPACE SECTOR

We specialise in:

- The milling and welding of special materials such as Stainless steel, Duplex, Titanium, Inconel alloys, ARMCO® Pure Iron, Hastelloy, Aluminium 7075 and other materials,
- 5-Axis CNC milling,
- Wire erosion,
- Upgrades and improvements of manufacturing technologies for space applications.

VALUE PROPOSITION/OFFERING

Diversity of high quality specialised services.

REFERENCES IN SPACE INDUSTRY

- AIRWORKS S.r.l.
- Skylabs d.o.o.

ŽustAl d.o.o.

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👤 Grega Žust

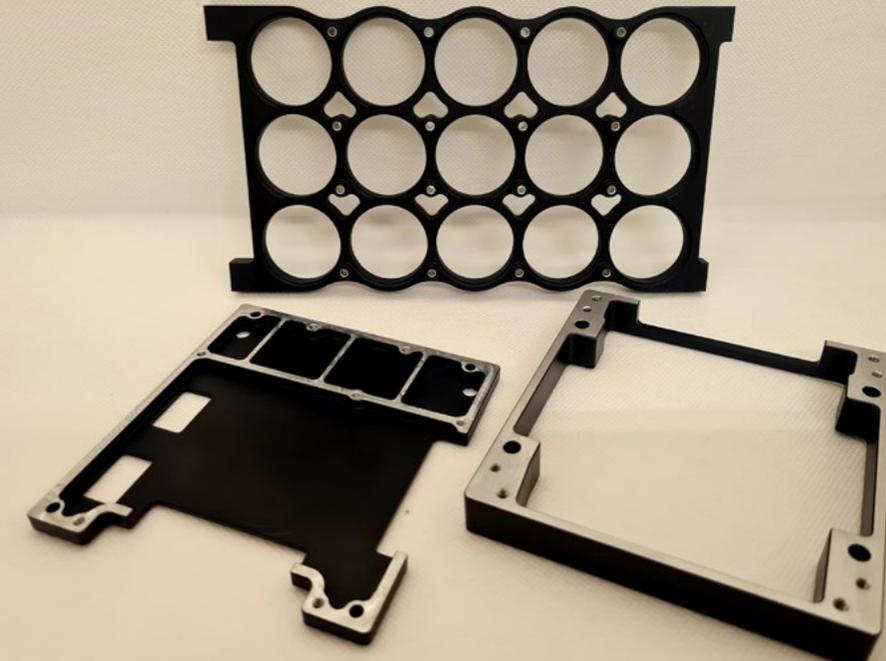
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Team ŽustAl; Our employees



Parts made from Aluminium for Space Industry made on OKUMA 5-axis milling machine

RESEARCH INSTITUTIONS

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SHORT DESCRIPTION OF THE INSTITUTION

In Vitanje lies a fascinating building, unique not only in Slovenia but also in the world. It offers rich and interesting content regarding the vast world of the universe, unimaginable achievements and amazing stories for all space lovers. The basic mission of the Centre Noordung is to research, collect and communicate the knowledge of space and space technologies to the public in a way that clearly connects and intertwines the science, economy, tourism and art.

SPACE SEGMENTS THAT ARE MOST RELEVANT FOR YOUR INSTITUTION

- Life in space
- Satellites
- Space applications
- Earth observation
- Space exploration
- Space mining
- Space settlement

MAIN ACTIVITIES RELEVANT FOR THE SPACE SECTOR

- Promotion of space technologies and the manifestation of human achievements in space,
- Innovative layout of the exhibitions about history of cosmology, visionaries of space travel and space technologies with the interplay of art, communicativeness and interactivity,
- Virtual reality experiences,
- Artificial intelligence in the form of a humanoid robot.

VALUE PROPOSITION/OFFERING

Modern and futuristic architecture stirs something more in us. Our unique place adds a cultural and humanistic contribution to human efforts to explore and understand the universe.

By connecting with and integrating into international connections, we ensure greater recognisability of Slovenian and international institutions in the field of space activities in all areas. Through the implementation of symposiums, we present and expand the significance of space exploration to the public and enable guided or independent tours of space exhibitions.

REFERENCES IN SPACE INDUSTRY

Cooperation with:

- United States Embassy in Slovenia
- NASA's Johnson Space Centre
- The Smithsonian Institution
- Partner of ESA ESERO education program for Slovenia

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SHORT DESCRIPTION OF THE INSTITUTION

The Geodetic Institute of Slovenia (GIS) is a leading Slovenian public institution for geodetic, geoinformatic, cartographic, photogrammetric and hydrographic research and development, established in 1953. A significant part of the projects is elaborated for national ministries and agencies.

MAIN ACTIVITIES RELEVANT FOR THE SPACE SECTOR

GIS processes all kind of remote sensing imagery for the supervision of agricultural subventions and land cover mapping. GIS is also authorised to operate distribution of precise GPS/GNSS data, the dissemination of maritime hydrographic data and the distribution of national periodical aerial surveys from WWII on.

VALUE PROPOSITION/OFFERING

GIS plays a bridging role between the public, private and research sectors and can integrate systematic spatial solutions for the entire country. More important, GIS as a national public institution can provide implementation of remote sensing data into the public administration where GIS knows the main driving processes and legislation.

REFERENCES IN SPACE INDUSTRY

- Monitoring of illegal and in-compliant constructions with machine learning,
- Mapping of intermittent water bodies from satellite imagery and chemometrics in combination with spectral imaging,
- Land use and land cover monitoring.

SHORT DESCRIPTION OF THE INSTITUTION

The Geological Survey of Slovenia (GeoZS) is a public research institute whose multidisciplinary activities in various fields of geoscience include:

- fundamental scientific research,
- applied research, explorations, and studies,
- international cooperation,
- provision of public services,
- transfer of the knowledge into practice to support national and local authorities' decisions and economy.

The main task of GeoZS is to improve the understanding of the geological structure of the Slovenian territory. This knowledge and expertise are crucial for addressing national challenges in the areas of environmental and health protection, drinking water supply, natural disasters protection, land management, exploration and evaluation of reserves and sustainable management of mineral resources, energy supply and energy efficiency. GeoZS acquires, manages, stores and interprets geological data and makes it publicly available. Our goal is to provide knowledge widely available to society and industry, to put research into practice, to popularise science and scientific culture, and to inform the general public.

SPACE SEGMENTS THAT ARE MOST RELEVANT FOR YOUR INSTITUTION

- Earth observation
- Space applications

MAIN ACTIVITIES RELEVANT FOR THE SPACE SECTOR

- Monitoring natural geological processes that pose a direct risk to humans or an indirect risk through impacts on development (landslides, subsidence, tectonic activities, mining activities),
- Warning and prediction of landslides,
- Disaster management and preparedness for a resilient society.

VALUE PROPOSITION/OFFERING

We provide research activities to detect ground deformation and earth surface displacement, landslide detection and monitoring for disaster management and preparedness for a resilient society.

REFERENCES IN SPACE INDUSTRY

Several completed and ongoing national and international research projects funded by national and foreign research agencies, the European Commission and the European Space Agency.

Geological Survey of Slovenia

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SHORT DESCRIPTION OF THE INSTITUTION

Within the "Jožef Stefan" Institute (JSI, www.ijs.si), Department of Environmental Sciences (DES, www.environment.si) focuses on multidisciplinary research with emphasis on combination of physical, chemical and biological processes that influence the environment, man and human activities. The work is based on three main areas: development, optimisation and validation of analytical methods, study of geochemical processes that influence cycling and transformations of substances and elements, and environmental impact assessment which evaluates the risk that human activities present for human health and for the environment.

SPACE SEGMENTS THAT ARE MOST RELEVANT FOR YOUR INSTITUTION

- Ground systems
- Space applications
- Earth Observations

MAIN ACTIVITIES RELEVANT FOR THE SPACE SECTOR

- Ground truth validation of satellite-based Earth observation data using combination of traditional and novel participatory (citizen-science) based approaches in environmental health monitoring,
- Environmental modelling and data analysing, data fusion and supporting (spatial) data infrastructures.

VALUE PROPOSITION/OFFERING

The Department of Environmental Sciences offers contract work for partners from industry, academia, public services and other customers. Our laboratories are specialised in inorganic and organic analytical chemistry, radiochemistry and isotope ratio analysis. Beside analytical services, we also provide strategic environmental assessment, consulting and project assistance in areas of environmental analysis, management of natural resources, eco-technologies, food research and authentication, and public health.

REFERENCES IN SPACE INDUSTRY

- EGIDA FP7: Coordinating Earth and Environmental cross-disciplinary projects to promote GEOSS
- ERA-Planet H2020: The European network for observing our changing planet
- ICARUS H2020: Integrated Climate forcing and Air pollution Reduction in Urban Systems
- URBANOME H2020: Urban Observatory for Multi-participatory Enhancement of Health and Wellbeing
- THEROS H2020: An integrated toolbox for improved verification and prevention of adulterations and non-compliances in organic and geographical indications food supply chain
- PARC, H2020: The European Partnership for the Assessment of Risks from Chemical



SHORT DESCRIPTION OF THE INSTITUTION

The Computer Systems Department at Jožef Stefan Institute employs over 20 researchers from different fields of computer science, electrical engineering, physics, food science and mathematics. Main basic research interests include data processing, management and visualisation, design of optimisation algorithms and adaptive computing platforms. The department is strongly engaged in European research mechanisms carrying over 10 H2020 and other projects. Besides these, the department is also very active in direct contacts with Slovenian industry resulting in several projects in recent years.

MAIN ACTIVITIES RELEVANT FOR THE SPACE SECTOR

- Artificial intelligence,
- Machine learning,
- Design of optimisation algorithms,
- Food data mining,
- Adaptive computing platforms,
- Image processing.
- Decision support and citizen science in the field of agriculture.

VALUE PROPOSITION/OFFERING

Scientific and applied research in computer science on any data.

REFERENCES IN SPACE INDUSTRY

Research on satellite communication optimisation, resulting in a journal paper:

- PETELIN, Gašper, ANTONIOU, Margarita, PAPA, Gregor. Multi-objective approaches to ground station scheduling for optimisation of communication with satellites. Optimisation and engineering. [Print ed.]. [in press] 2021, 28 str. ISSN 1389-4420. DOI: 10.1007/s11081-021-09617-z.
- Research on error correction in FPGA circuits useful in space applications, resulting in a journal paper:
- LEGAT, Uroš, BIASIZZO, Anton, NOVAK, Franc. A compact AES core with on-line error-detection for FPGA applications with modest hardware resources. Microprocessors and microsystems. [Print ed.]. 2011, vol. 35, no. 4, str. 405-416. ISSN 0141-9331. DOI: 10.1016/j.micpro.2011.03.001.
- Collaboration with the Slovenian company Cosylab which carries out strong activities in the space sector.
- Active collaboration within the Horizon 2020 MSCA project: UTOPIAE - Uncertainty Treatment and OPTimisation In Aerospace Engineering, <http://utopiae.eu/>.

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SHORT DESCRIPTION OF THE INSTITUTION

Basic and economically relevant research areas of NIB include the research on viruses, bacteria, plants, invertebrates and animals of higher orders, with special focus on biomedical topics. NIB works in close cooperation with affiliated university, research institutions and private sector in Slovenia and abroad. This synergy ensures that the knowledge developed at NIB is widely available to society through educational and outreach activities, and benefits the business community through transfer into practice.

SPACE SEGMENTS THAT ARE MOST RELEVANT FOR YOUR INSTITUTION

- Life in space
- Space applications
- Earth observation
- Space exploration
- Space settlement

MAIN ACTIVITIES RELEVANT FOR THE SPACE SECTOR

- **Space food production:** development of crops and/or algae production kit for optimised yield in space by adapting existing technologies.
- **Studying the impact of decreased gravity and space radiation on human health,** applying advanced test systems to simulate conditions in space and human exposure to these conditions, and furthermore study and potentially develop new therapies against cancer in the decreased gravity and space radiation environment.
- **Development of products based on raw satellite measurements** and tailored to waters. Such products (e.g. algal bloom detection) could benefit aquaculture, fisheries, tourism or other sea based enterprises (e.g. desalination plants).
- **Monitoring of biological systems in space:** (i) plant and microorganism biosensors that enable monitoring of target molecular mechanisms of growth, development and interactions in situ (ii) on-site diagnostics of microorganisms, e.g. pathogens or endophytes, (iii) analysis of water and air for biological agents and development of methods to control sterilisation techniques and materials with antimicrobial activity.
- **Monitoring of Earth factors from space:** Interactive real-time images of the Earth and multispectral images allow the development of systems for analysis/detection of plants under stress, and it is possible to develop sensor plants for stress.

VALUE PROPOSITION/OFFERING

NIB offers:

- Creation of new fundamental knowledge through basic and applied research in biology and related sciences, environmental protection, biotechnology and biomedicine,
- Knowledge transfers to application with the aim of improving the quality of life, supporting environmental policy and developing biotechnology for the needs of state and local institutions and for economic entities,
- High-tech instrumental and infrastructural equipment.

SHORT DESCRIPTION OF THE INSTITUTION

The Department of Remote Sensing brings together leading Slovenian experts in remote sensing. We deal with the development and application of machine learning methods in remote sensing, spatial analytics and cartography. We study problems of automatic registration of satellite images and their advanced classification, paying special attention to the development of new artificial intelligence techniques and modelling of natural and cultural landscapes. In collaboration with other academic groups, we conduct innovative interdisciplinary research in the anthropology of space and place and in archaeology.

SPACE SEGMENTS THAT ARE MOST RELEVANT FOR YOUR INSTITUTION

- Earth observation

MAIN ACTIVITIES RELEVANT FOR THE SPACE SECTOR

- Providing ai-ready training datasets from satellite and airborne platforms for various applications,
- Analysing the importance of optical imagery pre-processing procedures (radiometric and geometric corrections),
- Development of ground software for small satellites,
- Long experience with integration of eo data and products into new domains,
- Development of special algorithms for processing airborne laser scanning data,
- Testing the applicability of machine learning methods in different fields.

VALUE PROPOSITION/OFFER

In more than 25 years, we have successfully applied Earth observation in various applications ranging from rapid mapping and monitoring, land cover mapping in different landscapes, ground and air temperature modelling, detection of water bodies, and analysis of biophysical parameters for agriculture and forestry. We provide fast, accurate and reliable spatial data for efficient management of the natural and built environments.

REFERENCES IN SPACE INDUSTRY

Several completed and on-going basic and applied national and international projects, funded by various research agencies, European Commission, European Space Agency, Inter-American Development Bank, several national and local administrative institutions, and private companies.

Developers of DroughtWatch – a user-friendly feature-rich online tool for drought monitoring.

Developers of Relief Visualisation Toolbox (RVT), the go-to tool for visualisation of raster elevation model datasets.

Developers of algorithms for the processing of NEMO-HD small satellite data.

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SHORT DESCRIPTION OF THE INSTITUTION

SPACE-SI is specialised in the development and applications of microsatellite technologies. SPACE-SI is provider of satellite video and multispectral images from space and operates three ground stations in Slovenia for UHF, S and X band satellite communications. It has developed the first Slovenian microsatellite mission NEMO-HD, transportable ground station STREAM and processing chain for Earth Observation data STORM. The centre is equipped for thermomechanical testing and integration of materials, components, and space systems.

SPACE SEGMENTS THAT ARE MOST RELEVANT FOR YOUR INSTITUTION

- Ground systems
- Satellites
- Space applications
- Earth observation

MAIN ACTIVITIES RELEVANT FOR THE SPACE SECTOR

Small satellite mission design and operation (NEMO-HD):

- Video and multispectral imaging for low latency and real time Earth Observation,
- Agile and precise tracking of stationary scenes and Earth Observation paths.

Ground station development and operation (STREAM):

- Transportable ground station for S, X, Ka/Ku bands,
- Autotrack and feed technologies.

Earth Observation Data Processing and Applications (STORM):

- Video analytics for environmental and economic indicators,
- Monitoring of natural disasters, river basins, ports, etc.

Testing and integration of materials, components and systems:

- Thermomechanical testing in TVAC,
- Nanoindentation of materials.

VALUE PROPOSITION/OFFERING

SPACE-SI develops NewSpace products and services from satellite and ground segment components to the complete end-to-end solutions for advanced space missions.

REFERENCES IN SPACE INDUSTRY

Many national and international research projects and space missions for ESA, European Commission, Slovenian Research Agency as well as NEMO-HD, STREAM and STORM systems.



SHORT DESCRIPTION OF THE INSTITUTION

The Faculty of Civil and Geodetic Engineering of the University of Ljubljana was founded in 1919. The Faculty offers study and research programmes in the fields of geoinformatics and Earth observation, among others. It is the only faculty in Slovenia with bachelor's, master's and doctoral programmes in this field. The Faculty of Civil and Geodetic Engineering has been involved in several EU research programmes, e.g. the 6th and 7th Framework Programmes, H2020, COST, Leonardo da Vinci, ESPON, INTERREG. Research and development is carried out in various research areas in the field of geospatial data – from sensors for geospatial data acquisition, including mass data acquisition, to satellite remote sensing, photogrammetry, geoinformatics, geospatial data modelling and geospatial data infrastructure.

SPACE SEGMENTS THAT ARE MOST RELEVANT FOR YOUR INSTITUTION

- Earth observation

MAIN ACTIVITIES RELEVANT FOR THE SPACE SECTOR

- Optical image processing,
- Radar image processing, including insar processing,
- Applications of earth observation,
- Time-series and machine learning algorithms development,
- Education in earth observation and geoinformatics.

VALUE PROPOSITION/OFFERING

Almost 30 years of experience in Earth observation, image processing and application development. We have used remote sensing data for natural disaster monitoring, agriculture and forestry, natural environment monitoring, land cover and land cover change mapping, water body detection, and displacement detection and monitoring.

REFERENCES IN SPACE INDUSTRY

- National and international projects, funded by national and foreign research agencies, companies, European Commission, and European Space Agency
- InSAR processing for infrastructure monitoring workflow

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SHORT DESCRIPTION OF THE INSTITUTION

The UL FPP is a higher education institution engaged in education and scientific research in the fields of shipping, traffic, transport, logistics and process engineering. Most research projects are funded by EU programmes, relevant ministries of the Republic of Slovenia or the shipping and transport industry.

MAIN ACTIVITIES RELEVANT FOR THE SPACE SECTOR

- Maritime Adaptive GNSS Safety concept, MAGS; Improving maritime safety at port entry.
- Marine oil pollution; ongoing activities to protect european marine waters by monitoring oil spills and identifying and tracking oil spills on the sea surface through optical data analysis and sar.
- Monitoring accidental pollution in emergencies; linking different metocean data and producing ais up-to-date data to be used in pollution emergencies (hindcast simulation).

VALUE PROPOSITION/OFFERING

We have often provided assistance in real accidents at sea by integrating various sensors and devices. We have collaborated with the Italian Coast Guard, EC JRC and EMSA, among others. More recently, we have developed an application to detect ocean currents based on ship drift, which we monitor through the AIS system. At the same time, we are aware of the shortcomings of ship gyroscopes, which may be replaced by GNSS compasses in the future. Furthermore, we are developing an application for precise positioning of ships in port areas where GNSS reception is affected by multipath effects, and paying special attention to the latest research in maritime cyber security.



SHORT DESCRIPTION OF THE INSTITUTION

The University of Ljubljana is the oldest and largest higher education and scientific research institution in Slovenia. The Faculty of Mathematics and Physics is home to the Department of Physics and Department of Mathematics. Research is essential to our department and the programmes offered to our students are of the highest level by international standards as a direct consequence of our research activities. The faculty contributes more than 30% to the university "excellence" scores when calculated in various university ranking lists. This is an indisputable signature of the highest scientific standards of the working environment.

MAIN ACTIVITIES RELEVANT FOR THE SPACE SECTOR

The astronomy group is active in research, teaching and scientific outreach in astrophysics. Much of the research effort is related to observation of the universe, mostly using the James Webb Space Telescope, ESA's Gaia mission, Solar orbiter, Proba-3, Plato, and Athena, as well as large ground-based telescopes. We run the largest and the most complete set of courses in physics in the country, with an annual enrolment of around 130 students. The group is engaged (on a weekly basis) in public lectures, interviews for the media, translation of (also ESA related) materials and in STEM-promoting activities for secondary school pupils.

The meteorology group focuses on research related to the Earth-atmosphere system, such as the application of machine learning techniques in meteorological forecasting, analysis and changes in atmospheric circulation, and climate change. All the research is ultimately related to better predictions of current weather and future climate here on Earth.

FMF is active also in research of Nonequilibrium quantum and statistical physics, with activities related to ESA. All three groups led a number of research projects financed by ESA in the last decade.

VALUE PROPOSITION/OFFERING

We have been an active member of several ESA space missions (Gaia, HST, JWST, Solar orbiter, Proba-3, Athena) and we will continue in this role in the future. Therefore, we can serve as an interface between users (scientists) and industry. We are experts in advanced data manipulation and artificial intelligence methods. Moreover, we are playing an active role in scientific outreach activities, therefore informing, educating and motivating the general public in the context of ESA activities. Our very active role in the university teaching of students of physics is critical in development of human resources, including for industry.

We have the staff and the know-how to develop and implement complex algorithms for modelling of various processes, e.g. satellite dynamics, weather simulations/forecasts, etc. and perform difficult (serial or massively parallel) simulations on our own and associated HPC facilities. Additionally, we can provide proper scientific data analysis and analytical approximations of various processes/effects/models as needed.

REFERENCES IN SPACE INDUSTRY

Over the last 7 years the ESA-related research groups at FMF successfully completed one ERC project and received another ERC advanced grant, led 6 European Space Agency (ESA) projects, and contributed to others, often in a leading role. Our research results have been reported in 220 refereed scientific papers which have over 15,000 clean citations. Members of the team have received a number of national and international awards and recognitions.

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SHORT DESCRIPTION OF THE INSTITUTION

Scientific research work of UL FS is carried out in the fields of power and process engineering, design, mechanics and maintenance of machines, production engineering, mechatronics, micromechanic systems and automatization.

SPACE SEGMENTS THAT ARE MOST RELEVANT FOR YOUR INSTITUTION

- Ground systems
- Life in space
- Space settlement

MAIN ACTIVITIES RELEVANT FOR THE SPACE SECTOR

- Accelerated vibration fatigue testing and research,
- Ice properties at cryogenic temperatures and high velocities,
- Boiling heat transfer phenomena,
- Surface and interface nanotechnology, boundary lubrication and tribochemistry,
- Extreme mechanics of light-weight structures,
- High fidelity multi-scale and multi-domain models for batteries and fuel cells,
- Physicochemically consistently high fidelity and computationally efficient system level models,
- Physicochemically consistent observer models of batteries.

VALUE PROPOSITION/OFFERING

- Development of different custom mechanical components and equipment,
- Vibration fatigue research,
- Prototype machine for testing the properties of ice particles in air stream and water jet,
- Additive manufacturing services,
- Tribologically-optimised mechanical systems and maintenance-free lubrication of mechanical assemblies,
- Analysis of load bearing capacity, functionality and stability of these structure,
- Custom sensors,
- Services on production and joining of components.

REFERENCES IN SPACE INDUSTRY

ESA projects

- Prediction model of countermeasures efficiency on cardiovascular system and fluid shifting in simulated microgravity conditions
- Experiments and simulations on cavitation and cavitation erosion in cryogenic liquids (CryoCav); 2015 – 2017
- Cavitation in Thermosensible Fluids (CATHEF); 2011–2015
- ESA-funded boiling research project (AO-2004-III: BOILING)
- Scientific manuscripts
- Additive Manufacturing: Hybrid additive manufacturing of Inconel 718 for future space applications (Materials Characterisation, 2021)
- Numerical algorithms: Multiple Wrinkling Mode Transitions in Axially Compressed Cylindrical Shell-Substrate in Dynamics (Thin-Walled Structures, 2020)
- Structures: Wrinkling crystallography on spherical surfaces (PNAS, 2015)
- Aerodynamic Drag Control: Smart Morphable Surfaces for Aerodynamic Drag Control (Advanced Materials, 2014)

Scientific monograph

- Vibration Fatigue by Spectral Methods: From Structural Dynamics to Fatigue Damage–Theory and Experiments, Elsevier 2021

SHORT DESCRIPTION OF THE INSTITUTION

The Faculty of Electrical Engineering and Computer Science at University of Maribor is one of the leading institutions in Slovenia providing research, development and educational activities related to space technologies and space applications. The activities are mainly focused into new highly miniaturised space technologies and advance space applications targeting the New Space market by increasing the Ground and Space segment intelligence to tackle the needs of future space missions. From the educational aspect, the institution promotes space-related activities to the public and provides education of competitive engineers for the Slovenian space industry.

MAIN ACTIVITIES RELEVANT FOR THE SPACE SECTOR

Main research and development activities are covering various areas related to space sector and are performed by different groups, thus ranging from increase of performance and intelligence of on-board data handling of avionics to those including InSitu Earth observation applications and High-Resolution LiDAR data processing.

VALUE PROPOSITION/OFFERING

Institution gained first experience in operations of a spacecraft in LEO and now continues with operations of a spacecraft in MEO, whilst looking further into deeper orbits for Space Weather observations and general Deep Space missions like GEO and Lunar. The main focus is on Quantum sensors and relevant highly miniaturised Space technologies.

REFERENCES IN SPACE INDUSTRY

- TRISAT – In-Orbit Technology Demonstration and Earth Observation mission to LEO demonstrating Slovenian Space industry capabilities and qualifying Slovenian Space technologies in cooperation with company SkyLabs.
- TRISAT-R – In-Orbit Technology Demonstration and Radiation Observation mission to MEO demonstrating Slovenian Space industry capabilities, technologies and Instrumentation for Space Weather Observations and High-Performance Computing for Deep Space missions in cooperation with company SkyLabs.
- SDGS – Development and Implementation of Software Defined Ground Segment for operations of current and future Slovenian IOD Space missions.
- GaN – Testing and Qualification of new highly miniaturised Semiconductor technology in Radiative Environments to tackle further miniaturisation of System for Space while lowering Energy and Heat Dissipation Requirements in cooperation with company SkyLabs.

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SHORT DESCRIPTION OF THE INSTITUTION

University of Nova Gorica is a research oriented, internationally established university, providing creative environment which fosters top achievements in cutting-edge fields of science, technology and art. It promotes multidisciplinary research and contemporary study programmes with innovative teaching approaches designed to build partnerships between industry and academia and securing a high level of employability to national and international students.

Centre for Astrophysics and Cosmology (CAC) is the largest astrophysics research group in Slovenia. Its activities are interwoven with international research collaborations and focus on high-energy astrophysics: extremely energetic astrophysical sources, astrophysical transients, dark matter.

SPACE SEGMENTS THAT ARE MOST RELEVANT FOR YOUR INSTITUTION

- Space exploration
- Satellites

MAIN ACTIVITIES RELEVANT FOR THE SPACE SECTOR

- Research in astrophysical collaborations Fermi, Swift, Gaia, HST, JWST, THESEUS, Cherenkov Telescope Array Observatory (CTAO), Pierre Auger Observatory, Vera Rubin Observatory and others,
- Study programmes in Physics and Astrophysics at undergraduate and graduate level,
- Remotely controlled optical telescopes in Chile,
- Outreach in media, public events, web portal www.portalvvesolje.si.

VALUE PROPOSITION/OFFERING

- Research in theoretical and observational astrophysics,
- Numerical modelling of processes and phenomena,
- Numerical relativity,
- Orbital dynamics calculations,
- Advanced methods for data analysis,
- Characterisation of atmospheric properties.

REFERENCES IN SPACE INDUSTRY

2012–2022:

- 350 refereed papers with 28,000 citations
- 3 national Zois awards for research excellence, 1 Zois recognition award, 2 Apple of Inspiration awards
- Organisation of international events: first International Astronomical Union (IAU) Symposium in Slovenia (2016), Gaia Science Alerts Workshop (2018), Fermi Collaboration Meeting (2019)
- Prominent roles in international community: membership in the IAU – Div. D Steering Committee and in CTAO Council, evaluators for observing projects with NASA and ESA satellites, president of the IAU National Committee for Astronomy, etc.

Members of the CAC have led four ESA projects:

- ESA PRODEX Gaia Astrometric Microlensing Events – GAME
- ESA PRODEX Gaia Transients
- ESA PECS Relativistic Global Navigation Systems
- ESA PECS SLOIONO

and participated in:

- H2020-SPACE-2018 HERMES-SP (High Energy Rapid Modular Ensemble of Satellites – Scientific Pathfinder)
- ESA PECS A Fast Tool for Timing Analysis of Transient Astrophysical Phenomena



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The Center for Atmospheric Research (CAR) at the University of Nova Gorica conducts research in aerosol physics and chemistry in the context of climate change and air quality on the global, regional and local scales. We apply in-situ and remote measurements to study the effects aerosols exert on the climate. An important part of the activities are airborne measurements with (ultra) light aircrafts, and source apportionment of air pollution. We are specialized in measurements of aerosol absorption.

SPACE SEGMENTS THAT ARE MOST RELEVANT FOR YOUR INSTITUTION

- Earth observation
- Satellites

MAIN ACTIVITIES RELEVANT FOR THE SPACE SECTOR

- Research in aerosol physics and chemistry,
- Development and applications – instruments for aerosol research,
- Undergraduate and graduate study programs in Physics and Environment (Earth Science),
- Outreach in media, public events.

VALUE PROPOSITION/OFFERING

- Characterisation of atmospheric properties for satellite cal/val,
- Research in atmospheric physics and chemistry,
- Development of in-situ instrumentation for the determination of aerosol properties.

REFERENCES IN SPACE INDUSTRY

- 2012–2022: 165 refereed papers with 6578 citations, including very high-impact publications (cited more than 500-times)
- 4 patents – aerosol instrumentation
- 2 national Puh awards for excellence in innovation
- Prominent roles in international community: membership in the UN, EU and national committees on climate and science; journal boards; international and national standardisation bodies
- Members of the CAR have led (as principal investigators, PI) international projects and work-packages therein:
- ESA – Support to the Aeolus Validation and Calibration through Airborne Aerosol In-situ Observations in the Tropics (PI)
- H2020 – Photonic Accurate and Portable Sensor Systems Exploiting Photo-Acoustic and Photo-Thermal Based Spectroscopy for Real-Time Outdoor Air Pollution Monitoring (WP lead)
- ADEME, France – Source apportionment of PM10 in the Arve Valley (France) and evolution of the contribution of biomass burning emissions (co-PI)
- EUREKA Eurostars – Real Time Analyzer of Carbonaceous Aerosols (PI)
- Commissariat à l'énergie atomique et aux énergies alternatives, France – Development and validation of an operational tool for the discrimination between fossil versus modern fuel combustion aerosols: implication for air quality and climate abatement strategies (PI)
- EUREKA Eurostars – Fast and loading compensated Aethalometer – an instrument for real time measurement of light absorbing carbonaceous aerosol (PI)

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SHORT DESCRIPTION OF THE INSTITUTION

We are a privately funded research and education institution with the aim to provide Slovenian students with the opportunity to gain hands-on experience on conducting radio astronomy observations. We are developing a radio telescope aimed for primary observation of OH molecule emission on our location in Nova vas in the Kras region in Slovenia. We are planning to develop interferometry equipment and connect our radio telescope into an astronomical interferometer with additional receivers.

MAIN ACTIVITIES RELEVANT FOR THE SPACE SECTOR

Our main short term goal is to develop a radio telescope in Nova vas including complete hardware and data processing algorithms. Our vision is a completely automated radio telescope with a user-friendly interface. At present we are working on designing and manufacturing telescope montage and receiver chain.

VALUE PROPOSITION/OFFERING

- Student training,
- Testing radio astronomy observational procedures,
- Developing of data processing algorithms,
- Satellite downlink,
- Popularisation of science.

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MINISTRY OF THE ECONOMY,
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