



# Spain Space

## SPACE TECH EXPO 2023

November 14th – 16th 2023, Bremen (Germany)

Hall 5 – Stands L28 & L24

### Exhibiting companies

AENIUM ENGINEERING	<a href="http://www.aenium.es">www.aenium.es</a>
ANTERAL · Stand U52	<a href="http://www.antal.com">www.antal.com</a>
ARKADIA SPACE	<a href="http://www.arkadiaspace.com">www.arkadiaspace.com</a>
ASE OPTICS EUROPE	<a href="http://www.aseoptics.com">www.aseoptics.com</a>
AVS	<a href="http://www.a-v-s.es">www.a-v-s.es</a>
AXTER AEROSPACE	<a href="http://www.axteraerospace.com">www.axteraerospace.com</a>
CIMSA INGENIERIA Y SISTEMAS	<a href="http://www.cimsa.com">www.cimsa.com</a>
CITD ENGINEERING & TECHNOLOGIES	<a href="http://www.citd.eu">www.citd.eu</a>
COMET ENGINEERING	<a href="http://www.comet-ingenieria.es">www.comet-ingenieria.es</a>
COMPOXI · Stand E36	<a href="http://www.compxi.com">www.compxi.com</a>
COXPACE	<a href="http://www.coxpace.net">www.coxpace.net</a>
CT	<a href="http://www.thectengineeringgroup.com">www.thectengineeringgroup.com</a>
DHV TECHNOLOGY · Stand D45	<a href="http://www.dhvtechnology.com">www.dhvtechnology.com</a>
ELECNOR DEIMOS · Stand C51	<a href="http://elecnor-deimos.com">elecnor-deimos.com</a>
LOGO 2 MANUFACTURING	<a href="http://www.logo2.es">www.logo2.es</a>
EMBEDDED INSTRUMENTS & SYSTEMS EMXYS · Stand 527	<a href="http://www.emxys.com">www.emxys.com</a>
FENTISS	<a href="http://www.fentiss.com">www.fentiss.com</a>
GMV · Stand H21	<a href="http://www.gmv.com">www.gmv.com</a>
HYDRA SPACE SYSTEMS	<a href="http://www.hydra-space.com">www.hydra-space.com</a>
IDOM	<a href="http://www.idom.com">www.idom.com</a>
IENAI SPACE	<a href="http://ienai.space">ienai.space</a>
IACTEC SPACE	<a href="http://www.iac.es">www.iac.es</a>
LIDAX	<a href="http://www.lidax.com">www.lidax.com</a>
MADRID SPACE	<a href="http://www.madridspace.eu">www.madridspace.eu</a>
MICROLAN AEROSPACE	<a href="http://www.microlanaerospace.com">www.microlanaerospace.com</a>
OCCAM SPACE	<a href="http://www.occamspace.com">www.occamspace.com</a>
PROSIX ENGINEERING	<a href="http://www.prosix.es">www.prosix.es</a>
RADIAN SYSTEMS	<a href="http://www.radian.systems">www.radian.systems</a>
SATELIOT	<a href="http://www.sateliot.space">www.sateliot.space</a>
SATLANTIS	<a href="http://www.satlantis.com">www.satlantis.com</a>
UARX SPACE	<a href="http://www.uarx.com">www.uarx.com</a>

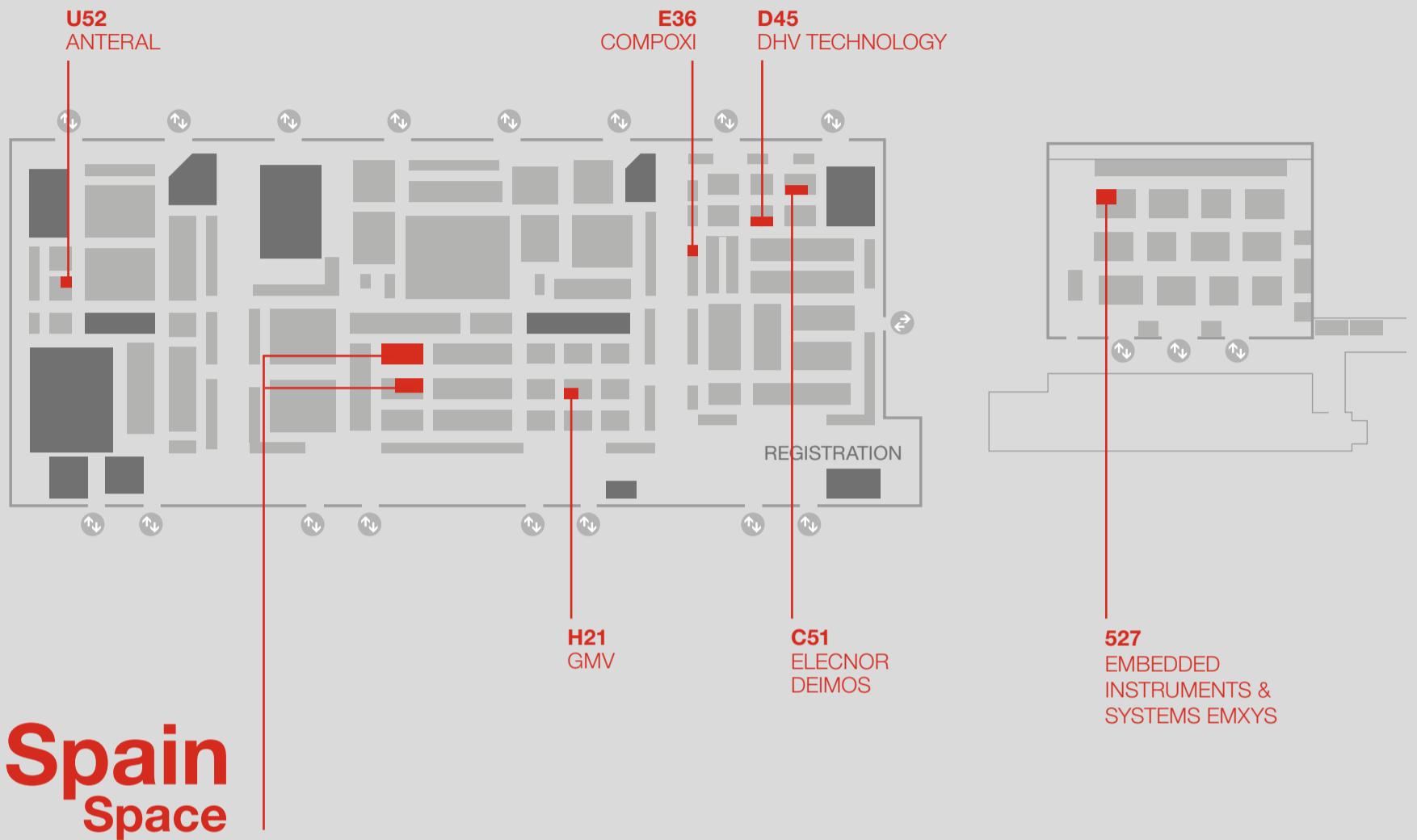
# SPACE TECH EXPO 2023

HALL 6

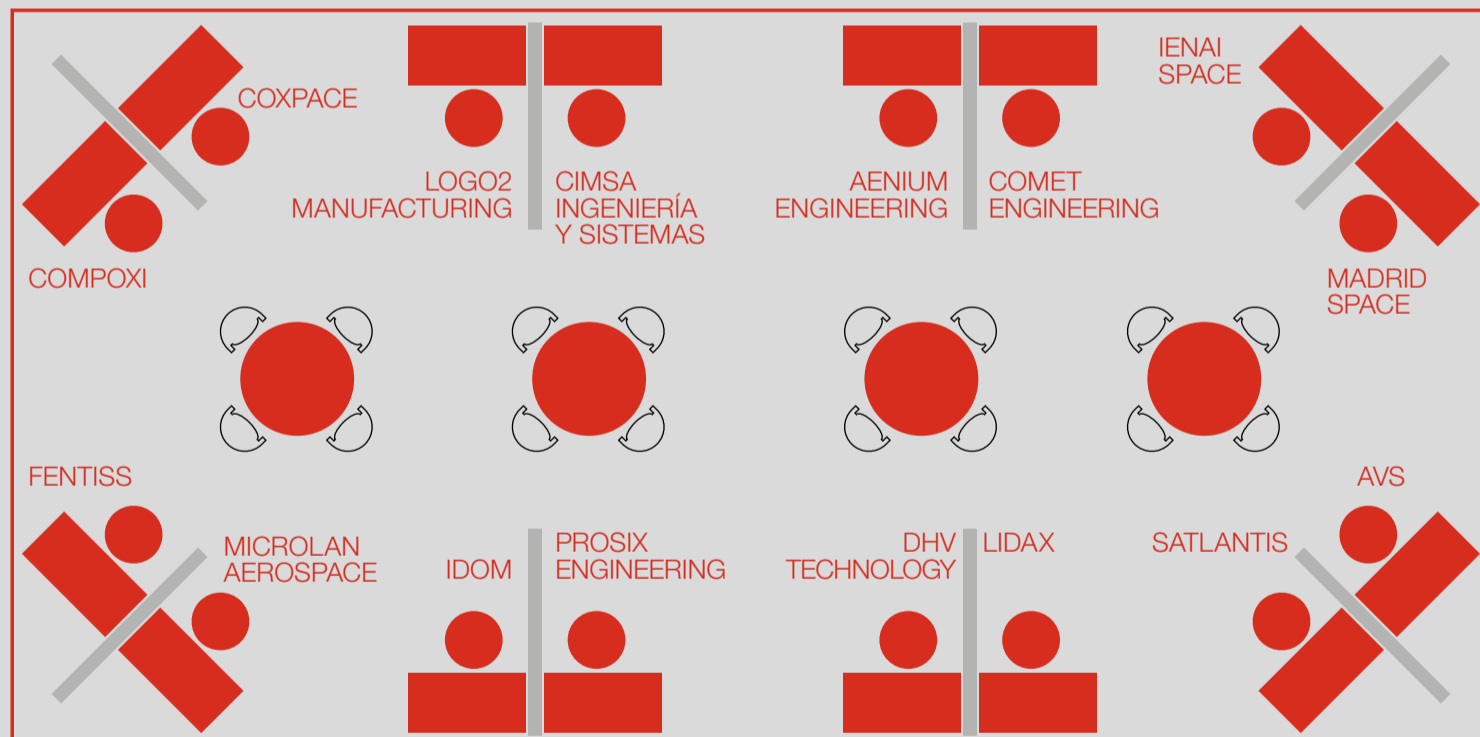
HALL 5

HALL 4

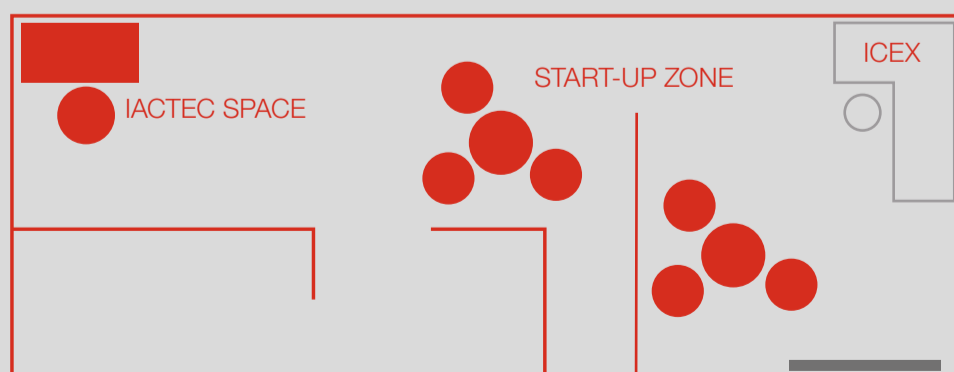
HALL 4.1 (Upstairs)



## HALL 5 – STAND L28



## HALL 5 – STAND L24



- ARKADIA SPACE
- HYDRA SPACE SYSTEMS
- UARX SPACE



**METAL ADDITIVE MANUFACTURING**  
**MATERIALS SCIENCE**  
**END TO END INDUSTRIALIZATION**

AENIUM is a R&D and industrialization company with wide expertise in material science, laser processing, additive manufacturing, metallurgy, and industrialization for space, defence and energy hardware. The company carries the most innovative new materials, LASER-based advanced manufacturing industrial processes and complex postprocessing to industrialization and qualification services for space propulsion, turbopumps, ignition systems, hypersonic hardware, space structure, energy and defence fields in 9 countries and 3 different continents working for main OEMs in the space defense and energy sectors in EU, US and Israel.

Wide experience from TRL3 to TRL9 and numerous flight orbit components certified and in orbit in satellite structures the company integrates industrial capabilities for additive metal manufacturing, DED AM, PFB, 5 axis machining thermomechanical and chemical treatments qualified by ECSS and NBLstd.

#### TECHNOLOGICAL CAPABILITIES / PRODUCTS

AENIUM provides services for materials engineering, metal additive manufacturing DED and SLM, mechanical processing, laboratory qualification and certification for space hardware as satellite structures, combustion chambers, ignition systems, igniters, turbopumps and others for in space propulsion systems through complex materials and advanced in-house laboratories and production field.

Materials engineering laboratory and metal alloy development. Industrial in-house capabilities for DED, manufacturing for multimaterial space and defence components, LASER metal additive manufacturing production field, thermal postprocessing, 5 axis machining, abrasive flow machining and etching.

Materials:

- GRCo42, CuCrZr, H282, Invar 36, Scalmalloy, Pure W, C103 Nb-Hf, 316L, Ti grade 6, Inco718, 316L.

#### MAIN PROJECTS

- Industrialization of satellite structures for LEO satellites launched by space X.
- Research, development and industrialization of biomaterial combustion chambers with dissimilar materials tested at DLR.
- Research and industrialize the first methalox aerospike tested and developed by Pangea Aerospace.
- Industrialization of injection headers and ignitions systems for H2 and Ch4.
- Certification for satellite constellation BW3 and BW1.
- Development and qualification of refractory nozzles for in space film cooled propulsion systems.



ANTERAL is a skilled and innovative company that was born at the end of 2010. Its main lines of business are divided into two areas:

- High-performance antennas and passives for Space, Telecommunications, Security & Defense or Academy applications, among others.
- Development of radar technology to boost innovative applications within Smart Cities, Industry, Education, among others. This line of development is known under the name of uRAD (Universal Radar, [www.urad.es](http://www.urad.es)) and was born in 2018 thanks to the company's strong commitment to R&D&i.

In addition to these two business lines, ANTERAL is very active in R&D, always counting on regional, national and European projects that allow it to continuously innovate and develop new solutions and products.

## TECHNOLOGICAL CAPABILITIES / PRODUCTS

Since its creation in 2010, ANTERAL has participated in the development of feed chains and passives (such as polarizers, diplexers, OMTs, filters, etc ) for more than 10 commercial and military satellites.

In addition, ANTERAL not only focuses on the development of horn antennas but also flat & conformal antennas. The main example of his contribution can be found in the development of Miura 1 by PLD Space. ANTERAL is responsible for the design, manufacture and validation of the 3 conformal multifrequency antennas that form part of the avionics of the first Spanish launcher. In addition, ANTERAL also participates in the development of the security antenna subsystem for the Space Rider vehicle of the European Space Agency (ESA).

Prior to 2010, his experience came from the UPNA Antennas research group that has participated in the design of power components for satellites since 1997. Some examples are: Hispasat 1C, 1D, 1E, 1F, AG1, Amazonas 1, Astra 3B etc Combining the experience of ANTERAL's technical advisors and founders together with the ANTERAL team, we obtain a top-level team, capable of managing and developing highly complex programs.

In addition, ANTERAL counts with a product catalogue of more than 250 products. These products are of great interest to universities, research institutes and companies and provide high performance solutions for ad-hoc applications. Some of its current products are Reflector antenna systems in Cassegrain or Fan-beam configuration with high directivity up to 500 GHz and 60 dB of directivity. Lens Antennas (LHA) for telecommunications and materials characterization applications. High gain lens antennas up to 45 dB, standard gain antennas (SGH), surface polarizers and filters (WGP & FSS), CATR solutions. Near Field Probes (NFP), dual linear or circular polarization systems for 5G applications, Radar technology, etc.

Finally, in 2018 ANTERAL launched its uRAD (Universal Radar) brand that includes all its radar developments. These products are innovative products that make use of radar technology to drive innovative applications. ANTERAL has different radar products working at 24GHz, 60 GHz and 77 GHz. This equipment is being used by ANTERAL and third-party companies to develop innovative solutions in sectors such as Smart Cities, Industry, defense and smart vehicles, among others. Some of the novel developments in which ANTERAL is immersed are:

- Development of solutions for monitoring and counting vehicles in Smart cities (vehicles, bicycles and boats)
- Development of indoor and outdoor people counting solutions
- Monitoring solutions for large ships moored in ports
- Access control solutions in industry
- Level sensing solutions
- Vital signs monitoring solutions, etc.

ANTERAL also has CE certification for its 24 GHz & 60 GHz radars and FCC certification is being done by some customers.

A copy of ANTERAL's product catalogue is available here:  
[https://antal.com/datasheets/Anteral\\_product\\_catalogue.pdf](https://antal.com/datasheets/Anteral_product_catalogue.pdf)

A copy of ANTERAL's space portfolio is available here:  
[https://antal.com/Anteral\\_in\\_space.pdf](https://antal.com/Anteral_in_space.pdf)

## MAIN PROJECTS

### Amazonas 3 (2011)

- 3 Spline profile horns (Ka-Band)

### Measat 3B (2012)

- 1 Axially and radial corrugated horn (X-Band)

### SES-10 (2014)

- 1 Axially and radial corrugated horn (Ku-Band)

### SES-12 (2015)

- Axially and radial corrugated horn (Ku-Band)

### Hispasat 1F (2014)

- 2 Spline profile horn with axial corrugations (Ka-Band)

### Amazonas 5 (2015)

- 1 Axially and radial corrugated horn (Ku-Band)
- 5 Spline profile horns (Ka-Band)
- 1 Septum polarizer (Ka-Band)
- More than 20 components manufactured

### Quantum (2018)

- Spline horn antennas (Ku-Band)
- Filters (Ku-Band)
- OMTs (Ku-Band)
- More than 20 components manufactured

### Kmilsat (2018)

- Axial and radial corrugated horns (X-Band)
- Polarizers (X-Band)
- Diplexers (X-Band)

### Egyptosat (2018)

- Axial and radial corrugated horn (Ka-Band)

### Spainsat NG phase one (2019)

- 2 Spline profile horns (X-Band)
- 2 Septum polarizers (X-Band)
- 2 Band pass filters (X-Band)
- Additional tooling and kits

### 16 unit SmallSat (Q4 2023)

- 1 Dual circular polarization dual band K/Ka (4-ports) radiating chain (Corrugated antenna, polarizer, OMT, diplexers and waveguide to k-connector adapter)
- 1 Dual circular polarization Q band radiating chain (Antenna, polarizer)

### Miura 1 (2023)

- UHF-band conformal antenna
- LS-band conformal antenna
- C-band conformal antenna

### Space Rider (2023)

- UHF-band planar antenna
- C-band planar antenna



[www.arkadiaspace.com](http://www.arkadiaspace.com)

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ARKADIA SPACE is a company developing green propulsion systems and thrusters based on green propellants, using as oxidizer Hydrogen Peroxide of High Concentration (98%). ARKADIA's family of thrusters include monopropellant and bipropellant ones, with a thrust range from 5N to 500N.

ARKADIA SPACE wants to be the real alternative to hydrazine-based propulsion systems, providing the same high performance (including hypergolic ignitions) of traditional systems at a fraction of the cost.

ARKADIA SPACE is supported and backed by space veterans, former astronauts, and by other investors, as well as by CDTI and the European Space Agency in the form of several contracts and grants.

#### **TECHNOLOGICAL CAPABILITIES / PRODUCTS**

- Green monopropellant thrusters based on decomposition of Hydrogen Peroxide (98%): from 5N to 500N
- Green bipropellant thrusters based on hypergolic ignition of Hydrogen Peroxide (98%) and proprietary fuel: from 50N to 200N.
- Turn-key propulsion systems based on green propellants for satellites and space vehicles above 50kg.
- Orbital propulsion test center located at Castellón Airport.

#### **MAIN PROJECTS**

ARKADIA SPACE has been awarded with three contracts by the European Space Agency: two of them as prime contractor, and one as subcontractor. The contracts have been related to the development of thruster technology based on green hypergolic fuels and related to the development of Reaction Control Systems based on monopropellant thrusters using Hydrogen Peroxide for big launchers and space vehicles.

ARKADIA SPACE expects to start its sales during 2023.



ASE OPTICS EUROPE provides fully integrated optical, optoelectronic, and photonic systems for critical applications and harsh environments. We are experts in optical systems design and engineering for new product development, and innovation is at the core of all our activities. With our rigorous systems approach and creative problem-solving processes, we design optical systems that improve reliability and performance. ASE has the experience and resources to meet precision optical systems assembly for prototyping as well as short series production. Our customers came from a broad range of application areas, including New Space, where ASE has proven optical systems.

### TECHNOLOGICAL CAPABILITIES / PRODUCTS

#### Optomechanical systems design:

- Custom lenses and zoom design.
- UV, VIS, NIR-SWIR, MWIR & LWIR systems.
- Reflective & catadioptric imaging systems.
- High N.Microscope objectives.

#### Systems integration:

- Precision optical assemblies.
- Laser systems integration.
- Ruggedized optomechanical systems.
- Optoelectronics assembly and integration.
- Prototypes, series production.

#### Production:

- High-end low volume series production.
- Supply-chain management.
- Reception, assembly, test, and delivery.
- After-sales technical and admin support.

#### Optical characterization:

- Automatic bench for EFL & distortion.
- OPD, PSF & MTF (UV to LWIR).
- MRC and resolution.
- BRDF.

#### Algorithms / Software:

- Image processing.
- Process automated and systems for integrated control.
- Analytical measurements.

#### Research and development:

- Collaborative EU and National funded research.
- Private R&D applied to new product development.

### MAIN PROJECTS

· ASE OPTICS has designed and developed different types of instrumentation for New Space depending on the requirements of each project.

· SWIR objective lens integrated into payloads for Earth Observation applications. Currently in orbit integrated into the DRAGO - 2 camera (Instituto de Astrofísica de Canarias - IAC). It has certified vacuum compatibility, with an optically athermal system, stable polychromatic MTF over the entire operating temperature range, and common focusing for two separate subwavebands.

· The MORERA project consists of a system for monitoring of efficient irrigation and agricultural yield. ASE OPTICS has performed the optical design and LWIR lens development. Applying free-form geometries in spatial optical systems reduces the system's size and cost. This R&D project is funded by the Spanish Government.

· Photsat project consists of the development of a very compact non-typical spectral waveband payload (4U) to be included in a new application in future missions of IEEC (Institut Estudis Espacials Catalunya) - Institute for Space Research of Catalonia, for the next space mission (nanosatellite) to be launched in 2025.



AVS, Added Value Solutions is a global SME established in 2006. Today we are proud of being one of the world's leading companies specialized in the development of complex equipment for industries such as fusion, particle accelerators, and space. With a remarkable track record and a strong focus on technological advancements, AVS has established itself in the Big Science and Space markets as a trusted provider of high-value, critical equipment worldwide.

#### **TECHNOLOGICAL CAPABILITIES / PRODUCTS**

With a remarkable history of achievements, AVS has earned global recognition for its high-value, critical equipment, advanced small missions and its role in groundbreaking projects with esteemed organizations like NASA and ESA. As AVS continues to push the boundaries of technology, it remains a trusted partner and a force to be reckoned with in the fields of mechatronics, robotics, and space exploration.

In AVS we are experts in design, manufacturing, assembly, tests and supply under ISO9001 and EN9100 certificates, with the advantage of the on-site manufacturing workshop and assembly and integration facilities, more than 10,000 m<sup>2</sup> of facilities distributed across six locations in Europe, as well as the UK and the USA, including clean rooms, providing our customers from the conceptual design to the turnkey.

#### **MAIN PROJECTS**

Over the years, AVS has achieved notable successes in space, including securing contracts with renowned organizations such as the European Space Agency (ESA), NASA, and ISRO, while also forming strategic partnerships with major European primes like Airbus, Thales, and OHB.

AVS's impressive achievements in the space domain encompass a wide range of projects. Notably, the company has contributed significantly to NASA's exploration efforts, including the development of two instruments for the Perseverance rover and the creation of three subsystems for the NASA-ESA Mars Sample Return Mission.

These collaborations with esteemed organizations and missions demonstrate AVS's growing presence as an advanced mechatronics and robotics provider for Moon, Mars, Earth Observation, Telecommunications and in-orbit servicing missions.

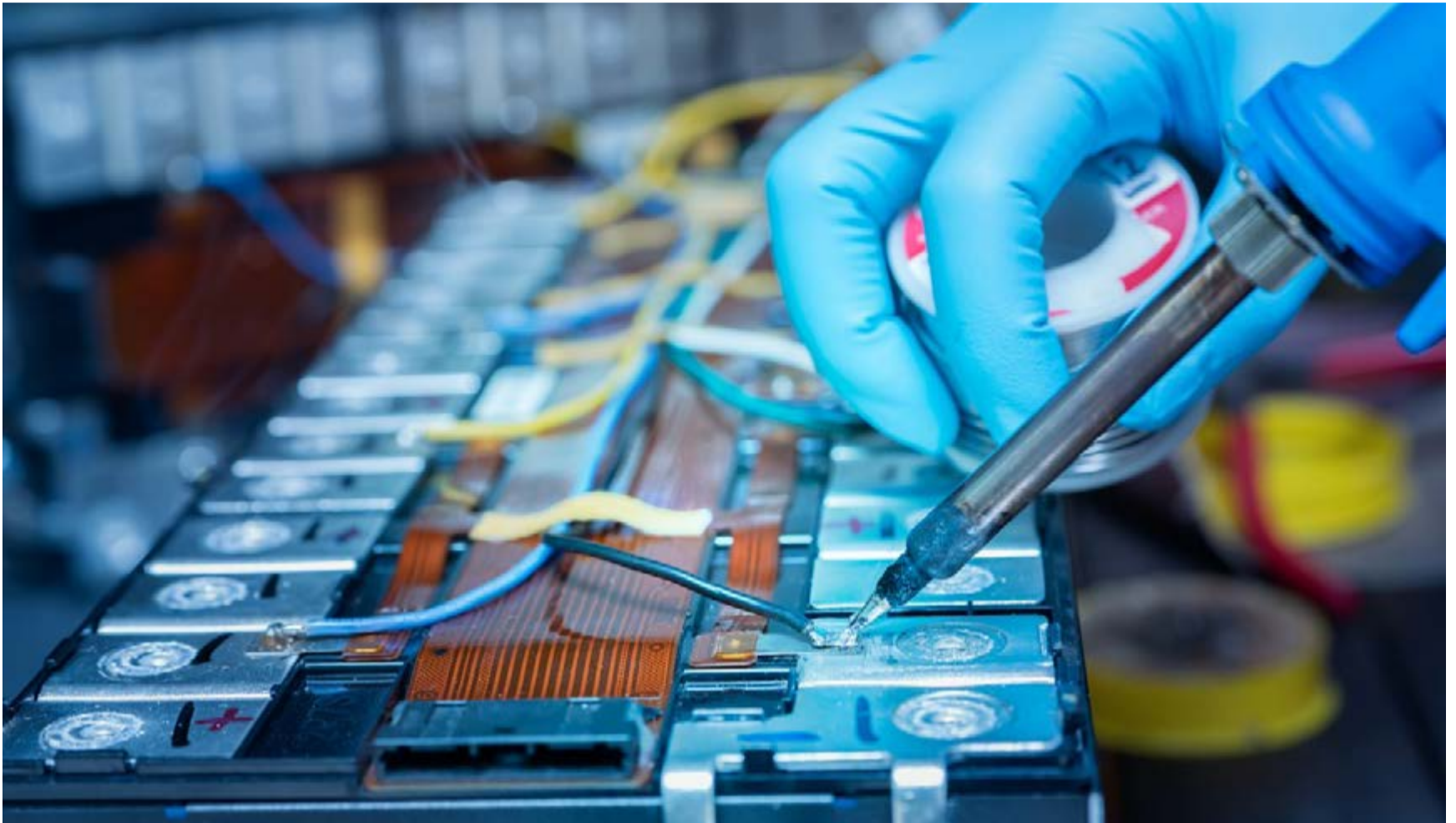
AVS has also been instrumental in the development of a disruptive water-based propulsion system in conjunction with URA Thrusters.

Additionally, AVS is eagerly preparing for the launch of its own small satellite missions in 2024, and a double satellite mission in 2025 representing a significant milestone as the first satellite of its class to be designed and manufactured by a private Spanish company

The LUR-1 mission space segment includes one 50kg microsatellite, which is designed to perform the IOD of several advanced subsystems developed by AVS and URA thrusters, including Active Thermal Control, Electro spray Propulsion, Electrolyzed Water Propulsion and Mechanisms.

**Rubén Piornedo**  
*R&D Responsible*

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AXTER is specialized in the development of hybrid/electric propulsion, electrical generation & distribution systems and battery systems for Aerospace and Defense Sectors.

#### **TECHNOLOGICAL CAPABILITIES / PRODUCTS**

- Tailored Power Electronics Development: AC/DC Converter DC/DC Converters; Electric motor/generator controller (BLDC bi-directional controller).
- Tailored Battery Systems Development.
- Application: hybrid/electric propulsion systems, electrical systems (distribution & generation) and energy storage systems.

#### **MAIN PROJECTS**

- AC/DC converter for fighter aircraft
- DC/DC converter for frigate
- Propulsion system (electric motor controller + battery) for Zeppeling
- Generator controller for long range aircraft.



Since its creation in 1934, as the sole supplier of parachute equipment for the Spanish Armed Forces (SAF), the main activities of CIMSA Ingeniería de Sistemas SA (CIMSA) have been directed towards the design, development and manufacturing of parachute systems for Spanish Armed Forces, inflatable rafts for the Spanish Navy, emergency parachute systems for Light Sport Aircrafts, steerable parachutes for Precision Airdrop Delivery, and the provision of related support facilities. Many years of close collaboration with Military and Aerospace customers have allowed CIMSA to accumulate vast experience and has positioned the company as one of the leading players in research and manufacturing worldwide, in the fields of textile aero-braking and aero-elastic systems.

#### **TECHNOLOGICAL CAPABILITIES / PRODUCTS**

CIMSA has developed its own R&D Division allowing the company to successfully respond to a broad range of requirements from Military and Aerospace customers not only in the area of parachute systems, but aircraft and bomb braking chutes, inflatable life-jackets and bullet proof jackets, inflatable rafts and containers, guided load airdrop systems, anti-spin systems and other advanced systems.

CIMSA owns all manufacturing equipment and facilities required to produce with high quality standards a large number of products related to the textile products. To ensure a customer satisfaction, CIMSA currently works with high precision equipment for structural analysis, static and dynamic testing, and special recoverable vehicles with sophisticated electronic on board devices

#### **MAIN PROJECTS**

- IXV-Recovery System Preliminary Design Phase B2-C1– for Thales Alenia Space Italy.
- Space Rider Re-Entry Module Parachute Recovery System – for Thales Alenia Space Italy.
- ARIANE5-Booster Recovery System, in consortium with Dutch Space, Autoflug and the Russian Parachute Technological Institute.
- EUROTORP parachute stabilization and braking system for LEONARDO D&S
- Manufacture of ring slot brake EUROFIGHTER parachute for AIRBUS D&S
- Design of an integrated DGB type parachute and antenna system for landing in Mars and Titan atmospheres for the European Space Agency
- Anti-spin recovery system design, production and qualification for a Trainer Aircraft weighting 4000 kg in cooperation with US partner BRS Aerospace Inc.
- Design, manufacture and qualification of parachute recovery systems for UAV 's weighting from 5 kg up to 2000 kg.
- FASTWING parafoil design, manufacture and qualification tests within the frame of European Union Framework Program. Payload weight up to 6000 kg.
- Design, production and qualification of steerable parachute systems for Precision Airdrop Delivery cargos weighting from 50 kg up to 6000 kg.



[www.citd.eu](http://www.citd.eu)

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CiTD has more than 20 years of experience in Design, Engineering, and Manufacturing in the Aeronautical/Defense/Space sectors working with a variety of international customers in unique and challenging projects, from traditional services and products to new technologies and advanced innovation.

We deal with the full product lifecycle covering the design, engineering, prototyping, testing, and manufacturing phases of complex, customized components and provide a wide range of specialized services at one single place.

#### TECHNOLOGICAL CAPABILITIES / PRODUCTS

Our key areas: Aerospace structures, Integration of Electrical Systems, and Additive Manufacturing.

In regards to Aerospace structures, we develop aerostructures, launcher and satellite structures from conceptual design to detail CAD design, analysis justification covering all disciplines: CFD, stress, dynamic, non linear, thermal and structural testing for final qualification.

Concerning Electrical Systems, Aerospace electrical systems development for military and civil aircrafts, space launcher and satellite flight harnesses in line with ESA standards are our main products.

And last but not least, Additive Manufacturing. Additive Manufacturing becomes, since 2017, one of our main commitments: “make it fly”. CiTD is focused on Additive Manufacturing of flying parts, with Design, Manufacturing and Qualification activities.

CiTD has its own means of manufacturing polymers (FDE) and metallic materials (PBF) at our facilities in Aeropolis.

With reference to Innovation, we would like to accentuate that we are an innovative SME, promoting new technologies to «make them fly”. Additive Manufacturing technology, Zero emissions Aviation products as well as improvements in Aerospace production are our main lines of innovation.

This is the case of Additive Manufacturing where, covering the complete product cycle, we became pioneers in the development of AM flight parts in space missions such as CHEOPS and JUICE.

On the other hand, In CiTD Zero-E developments we are focused in the reduction of the impact of aviation in the environment: all electric aircraft with integrated carbon fiber structures, hydrogen aircraft CFRP storage systems and new smart sustainable aircraft fuel (SAF) systems to reduce condensation trails.

As well as new technologies such as IA applied to manufacturing process control and process simulation; and new concepts in production that are key for New Space Constellations.

#### MAIN PROJECTS

- CiTD has developed structures in metallic materials as well in the most advance carbón fiber composites since 2001, working in the most relevant Space European programs such as Ariane 5-6 from ARIANESPACE and Vega launcher from ELV and challenging Airplanes such as AIRBUS A380 and AIRBUS MILITARY AIRCRAFTS as A330 MRTT and C295.
- Electrical Design, Routing and Installation are core activities where CiTD can manage from pin to pin definition to engineering development, manufacturing and integration in the final product, as we’ve done in the European Space Agency COPERNICUS program SENTINELS.
- Exhausting systems, fuel and bleed air systems are part of CiTD portfolio in different aircrafts, highlighting the AIRBUS A380 risk sharing contract from 2002 to 2018 for the engineering and manufacturing of the tailcone exhausting systems for auxiliary power unit (APU).
- Since one of our commitments became: “make it fly”, we have already a total number of 15 Additive Manufacturing flying parts in CHEOPS and JUICE missions for AIRBUS & ESA (European Space Agency) in Titanium and Aluminum.
- Other services offered by CiTD are linked to developments in other industrial sectors such as electromechanical components and tooling design for large scientific facilities in the Energy industry, Transport and Naval industry for clients such as AIRBUS, CERN, ITER and NAVANTIA.



COMET Engineering is a company with more than 15 years of experience providing high added value structures and components for the aerospace sector and highly skilled mechanical engineering services.

**It develops:**

- High gain deployable reflector antennas with apertures between 1-meter and 10-meters.
- Deployable helix antennas for VHF and L-band.
- Satellite platform and launchers structures.
- Launcher fairings and launchpads with embedded metamaterials with launch sound reduction capabilities that reduce the acoustic loads in satellites.
- Deployable structures, booms and masts with extraordinary compact ratio that enable new missions and possibilities.
- Low CTE struts with high accuracy and thermoelastic stability.
- High skilled thermo-mechanical engineering services

Comet has a highly qualified human team, with an average experience in the profession of more than 15 years. This extraordinary team allows it to develop and manage large multidisciplinary projects in which efficient coordination between work teams is essential.

In the aeronautical field, it has recently achieved DOA certification from EASA and is about to achieve POA certification as well, developing modifications and repairs aircraft (CS 23) and Helicopters (CS 27, CS 29).

**TECHNOLOGICAL CAPABILITIES / PRODUCTS**

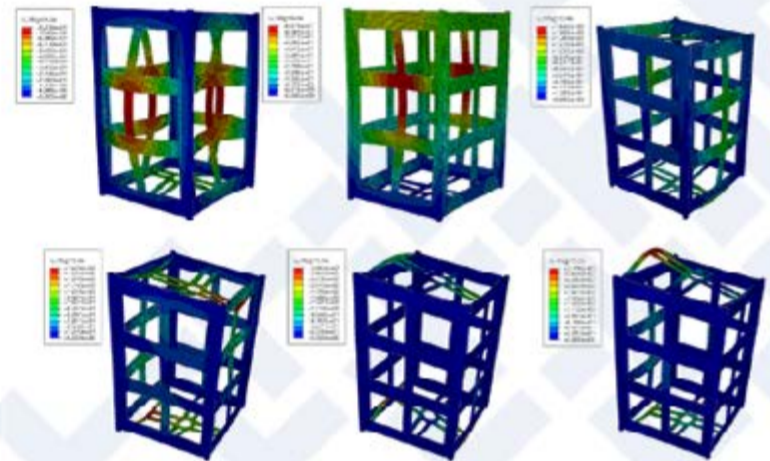
COMET Ingeniería has a strong thermo-mechanical engineering area (design, analysis, manufacturing and testing), with a staff of 25 engineers, designers and technicians with a high degree of preparation and experience in many within the space, aeronautical, railway, industrial and naval sectors, among others. Its main capabilities are:

- Design of metal and composite space structures such as platforms, assemblies and components.
- Feasibility and concept design of new deployable structures, antennas, booms and ultra-light space structures that enable new space missions and capabilities, including trade-off studies, fast prototyping and proofs of concept.
- Thermomechanical design and analysis of space structures and components.
- Manufacturing of breadboards, demonstrators, EM, QM and FMs following the most exigent quality standards, ECSS and PA&QA procedures.
- Thermo-mechanical tests and validation of components and structures.
- MGSE and toolings for space structures.

**MAIN PROJECTS**

The following projects have been developed by Comet are financed by ESA, and made in cooperation with relevant companies such as Airbus DS, Open Cosmos and others:

- Leading ESA TDE and GSTP project “Deployable reflector antenna for cubesat missions”, in which a deployable offset-fed reflector is being developed in order to enable future satcom and ENS missions, reaching TRL6.
- Participating in the ESA TDE activity “Very wideband VHF deployable antenna and RF matching network” with the objective of designing, manufacturing and testing a Wideband Deployable antenna and RF matching network suitable for integration in Future Earth Observation subsurface radar instruments.
- Participating in ESA de-risk activity for candidate SCOUT Mission NANOMAGSAT, led by Open Cosmos, in which a deployable highly stable CFRP mast of 3 meters length to be accommodated in a 12U cubesat, with amagnetic and low conductivity characteristics. Comet is responsible of the mast and optical bench development and has reached TRL6 in Q3 2023 (full test of an EM).
- Leading ESA TRP project “Launch Sound Level Reduction” with the aim of investigating all aspects of acoustic noise phenomena during ignition and lift-off, translating them into suitable parameters which can then be used in co-designing of novel sound attenuation systems for the launch pad and for the fairing, in cooperation with CNRS/LAUM (France), ITEFI-CSIC, Universitat Politècnica de València and Universidad Politècnica de Madrid (Spain).
- ESA TRP project “Modular Deployable Structures”. During this project, two large deployable structures have been successfully developed and tested, reaching TRL4: a large deployable mast of 10 m long and a large deployable ring of 6 m diameter, with a representative cable network and inner metallic mesh. Both structures are composed of CFRP struts. A preliminary design large deployable reflectors for missions CIMR and ROSE-L was done in this contract.
- ITI A & ITI-B: “Passive Damped Deployment of Full Composite Structures”, with the aim of demonstrating the validity of Carbon Fibre reinforced with Flexible Epoxy for space applications, such as the damped self-deployment of composite booms with the use of tape-spring hinges.
- Technology Transfer Proof of Concept and Technology Transfer Demonstrator project “Flexible Skins for Aircraft Surfaces”, where Carbon Fibre Reinforced with Flexible Epoxy Resin used for space applications has been transferred to the aeronautic industry, developing a flexible skin needed to allow a morphing elevator in an aircraft.
- Participating in ESA TRP project “In orbit surface metrology for large deployable reflectors” which objective is to apply existing terrestrial metrology technology to provide high precision deployed surface shape measurements of Large Deployable Reflector Antennas (LDR) while in-orbit and relative to a fixed point on the spacecraft.



A reliable partner  
of space hardware

COMPOXI is a skilled SME devoted to the design, engineering, qualification and manufacturing of advanced composite structures for the space markets.

COMPOXI has a strong heritage in a space structures and wide portfolio including honeycomb structures, antennas, radomes, reflectors and many other structural elements for satellites and launchers, ranging from satellite walls to lunar rovers or optical payload structures.

## TECHNOLOGICAL CAPABILITIES / PRODUCTS

Full design office with turnkey capabilities including:

- Design and advanced sizing of composite materials parts (mechanical and thermal)
- Design and advanced sizing of hybrid metal-composite structures (mechanical and thermal)
- Qualification campaign of new products or materials.

Manufacturing facilities including:

- > 400 sqm of ISO8 certified clean room
- Autoclave & ovens (2.6 meters x 4 meters, 1.6 meters x 2 meters, >250°C)
- High precision milling machine (3 meters x 2 meters)
- RTM setup including heating elements,
- Advanced Fibre placement robot cell
- Assembly, Integration and testing area
- Laser scan inspection system
- NDT inspection systems.

## MAIN PROJECTS

- COMPOXI develops and manufactures tailored solutions for all kind of missions (vLEO, LEO, GEO and beyond)
- Present in european missions (SORA, EXOMARS, FLEX, JUICE, etc...)
- Present in European launchers (VEGA & ARIANNE)
- Co-engineering and manufacturing of Rashid Rover full body for MBRSC
- Co-engineering and manufacturing of substrates, walls and other structural elements for smallsat constellations
- Co-engineering and manufacturing of telecommunications elements such as reflector dishes, radomes and other antenna elements.



COXPACE offers the design, assembly and integration of Electrical Wiring Interconnection Systems (EWIS) on ships for Aeronautic, Defense and Space sectors.

We develop our services on aircraft, drones, ground vehicles, test benches, HAPS, satellites, launchers and space modules (including space manned missions).

A turnkey solution to help our clients the management of just one subcontractor, giving them the best market quality standards.

Contact us from engineering definition phase and leave in our hands the electrical wiring of your ship. The continuous communication between design and production allows us risk mitigation and product optimization.

Please, visit our website for details about products & services, and references, as well: [www.coxpace.net](http://www.coxpace.net).

## TECHNOLOGICAL CAPABILITIES / PRODUCTS

### MANAGEMENT:

Project management capability / From purchasing to program follow up / Risk assessment and mitigation / Integrated life cycle management: PDM, ERP, MES

### DEVELOPMENT ENGINEERING

- Analysis and System Definition
- Full Electrical Design: Electrical Schemes / Wiring Diagrams / 3D Routing / Connectors and backshell selection / BOM
- Mechanical design and Analysis: 3D design / Definition drawings / Manufacturing documentation / FEM analysis / Stiffness and Stress documentation / Manufacturing and installation documentation

### MANUFACTURING

- Purchasing and Supply chain optimization / Manufacturing orders following Industry 4.0 standards / Mock up installation / Hand, semiautomatic and automatic manufacturing / Inspection and automated testing / Full test reports and logbook
- Packaging and container preparation / Shipment

### INTEGRATION ON SITE:

Harness installation / Test on site / Commissioning

### SUPPORT

Repair and Maintenance  
Design Improvements  
Scanning on board and digital mock up creation

### R&D

Additive Manufacturing  
Augmented Reality

### MAIN PROJECTS

- VEGA - C
- SENTINEL 6
- ALPHA BUS
- GAIA
- VEGA
- PAZ
- GALILEO
- SENTINEL 2
- SENTINEL 3
- ARIANE 5
- EXOMARS
- AB7
- SK5D
- W5A
- MEASAT
- NEWSAT
- EB9B
- AMU1
- SKYBRASIL
- E172B



**ENGINEERING  
DRIVEN  
PEOPLE**

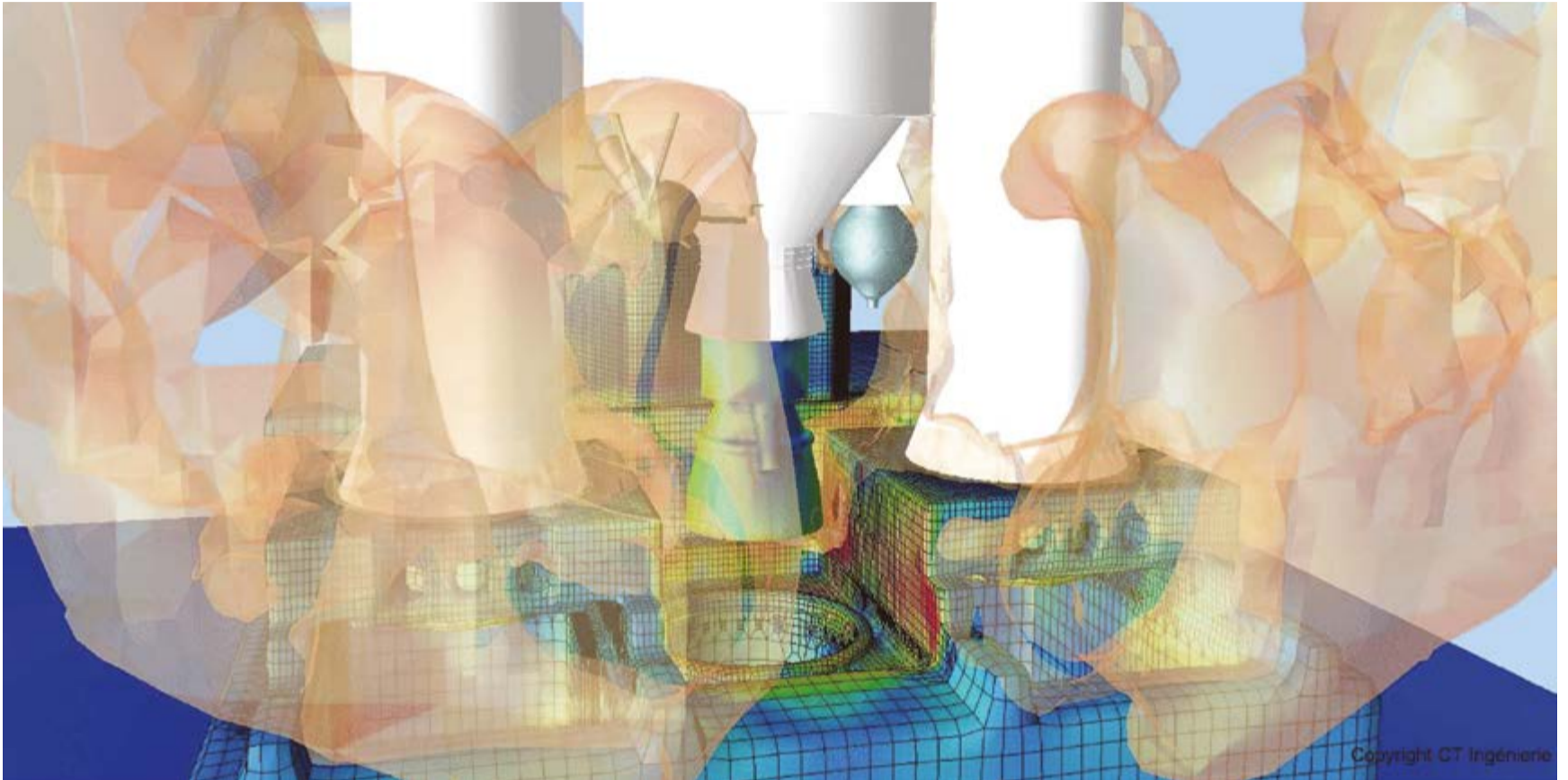
[www.thectengineeringgroup.com](http://www.thectengineeringgroup.com)

**Delia Rodríguez de Llera**

*Head of Innovation*

T. +34 690 110 566

[drllera@ctingenieros.es](mailto:drllera@ctingenieros.es)



The CT ENGINEERING GROUP (CT) is a leading technological company that provides innovation and engineering services in the aeronautical, space, defense, naval, automotive, rail, energy and industrial plants sectors. CT pushes the boundaries of technology through innovation, raising performance to new levels throughout the entire life cycle of products, from design, manufacturing to post-sales support. With over 35 years of experience, today CT's success is driven by more than 1,800 talented employees based in nine countries, spanning three continents.

At CT we actively participate in the process of digital transformation, supporting our clients in the process of change, providing incremental and tailored solutions. Every day, our engineers work side by side with customers in all engineering activities across the product lifecycle. Each one of them strives to understand client needs and provide solutions, while maintaining an easy and enjoyable customer experience. At CT, we enjoy helping clients achieve their goals, and we see barriers as opportunities. We are engineers that love engineering challenges.

#### **TECHNOLOGICAL CAPABILITIES / PRODUCTS**

From future concepts to detailed design, economic, technical and margin assessments, CT provides full space system capabilities. Based on more than 30 years of studies, our engineers address a broad range of challenges across all space system, including the New Space Industry ones, such as reducing costs and increasing flexibility.

CT brings innovation across the entire space system life cycle in various segments, such as satellites, small and large launch vehicles, ground segment, and space debris mitigation. Based on advanced uses of modelling, we bring together future concepts from economic and technical assessments, technology consulting, Multiphysics systems optimizations, detailed design, and margins assessments.

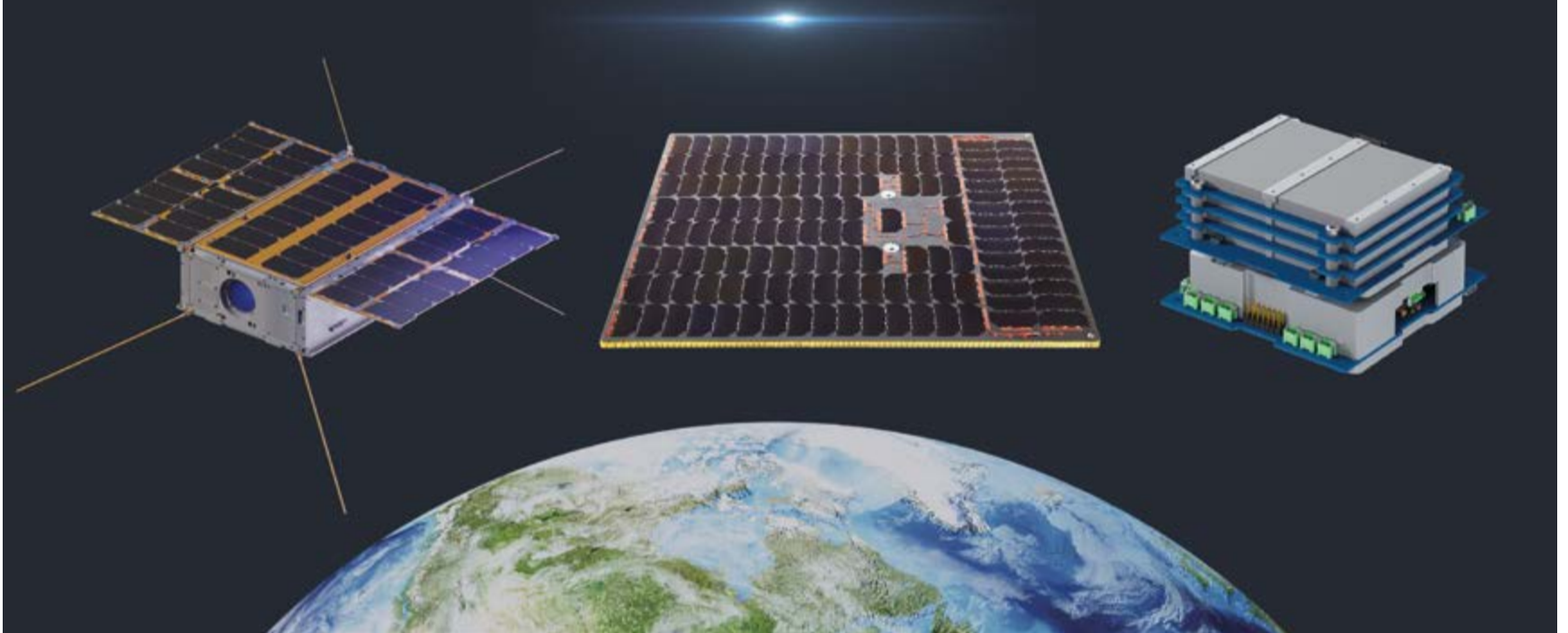
CT is one of the largest suppliers of engineering services to Airbus Defence & Space.

We are developing a unique capability in design-to-cost and coupled analyses, including multidisciplinary design optimization and Data Analytics.

#### **MAIN PROJECTS**

Over the last three decades, CT has been a trustworthy partner in the most important European aerospace programs (Ariane 4, 5 and 6, Cheops, Amazonas, Electra, SMILE, Euclid, Vega and MTG, among others.) and R&D initiatives, working side by side with labs, start-ups, industrial actors and agencies such as ESA, CNES, CEGELEC and MT. Moreover, CT holds various patents related to space debris mitigation and just in time collision avoidance, developing a unique mix of know-how and software tools. Preparing the future of space technologies and methods, we are core team partners in various space H2020 projects.

# Supplying Power to your Space Mission



DHV TECHNOLOGY is a Spain based international company that designs and manufactures solar panels for space applications and other power subsystems for different platforms.

## TECHNOLOGICAL CAPABILITIES / PRODUCTS

- 3700 m<sup>2</sup> of facilities (1200 m<sup>2</sup> clean room; 1000 m<sup>2</sup> offices; 1500 m<sup>2</sup> warehouse and others)
- Design / Engineering Services
- Electronics Manufacturing
- Engineering Consultancy
- Qualification and testing services (TVAC chamber, 0g-MGSE).

## MAIN PROJECTS

- Standard and customized products
- Constellation projects manufacturing
- LEO, MEO, GTO, GEO, lunar and deep space missions' solutions
- Complete Power Supply Systems for SmallSats and CubeSats
- CubeSats Power Solutions:
  - Solar Panels for CubeSats: Standard and custom solar array solutions for any kind of CubeSat platform as 1U, 2U, 3U, 6U, 12U and 16U. Deployables, cut-out areas and other customizations are also available under request.
  - Electrical Power Systems (EPS): Electrical Power Systems (EPS) designed to be integrated into different CubeSat platforms from 1U to quad deployable 16U. Deployment control, maximum power point tracking and other features available.

- microSADA: Solar Array Drive Assembly (SADA) in charge of rotating the solar arrays to keep them optimally oriented with respect to the sun and providing a path for power transfer from the arrays to the CubeSat bus.

### · SmallSats Power Solutions:

- Solar Panels for SmallSats: Deployable and body mounted tailor-made solar array solutions for small satellites. Our solar arrays are manufactured on PCBs or honeycomb aluminum substrates covered with carbon fiber reinforced polymer (CFRP) layers, integrated sensors, etc.
- PCDU: The Power Conditioning and Distribution System PCDU has been designed to be integrated into different SmallSats systems. This PCDU is developed to provide an efficient power supply and control for any type of mission and it is composed by a power management module and a battery module.
- Multi-Layer Insulation Blankets: Thermal insulators conformed by multiple layers of optical and electrically conductive materials separated by thin netting spacers. MLI Blankets are fundamental pieces in the spacecraft thermal control and critical in preserving the spacecraft from the space extreme temperatures.



ELECNOR DEIMOS provides systems engineering, ground segment, mission analysis and design, onboard software and satellite integration for Science and Exploration, Satellite Navigation, Earth Observation, Space Safety and Launchers. Our capabilities include the development of turnkey operational systems for aeronautical and maritime applications, both civil and military. The company also provides services for the transport sector, digital transformation solutions and location-based services.

#### **TECHNOLOGICAL CAPABILITIES / PRODUCTS**

ELECNOR DEIMOS provides systems engineering, ground segment, mission analysis and design, onboard software and satellite integration for Science and Exploration, Satellite Navigation, Earth Observation, Space Safety and Launchers. Our capabilities include the development of turnkey operational systems for aeronautical and maritime applications, both civil and military. The company also provides services for the transport sector, digital transformation solutions and location-based services.

#### **MAIN PROJECTS**

- Sat4EO
- Clearspace GNC
- Comet Interceptor Probe B2
- Neptuno Satellite
- Copernicus Imaging Microwave Radiometer Data Processor
- G3STAR GNSS receiver for Cubesats
- Exomars
- EO-Alert
- Sentinel-3
- Cheops
- Juice
- Lagrange
- Discoverer
- NextGEOSS



LOGO2 provides design & manufacturing services for the aerospace industry.

Currently the production center located in Elche can support precision machining of parts up to Ø700 x 400mm in 5th axis and 700 x 400 x 300 mm in 3rd axis, turning parts up to Ø250 x 1000 mm and the production of sandwich structures up to 1.2m by 2m in composite materials.

#### MAIN PROJECTS

The main projects that we have support has been the production of 3U & 6U cubesats for the OTTER mission among others.

The impactor for the ESA mission HERA.

In larger components we are supporting the development of an OTV vehicle & one of the largest small SAR constellations in the world.

On the composite side we have launched different solar array and deployable structures to orbit and we are working on the development of a module micro-satellite platform.



[www.emxys.com](http://www.emxys.com)

**Francisco García de Quirós**  
*Chief Technology Officer*

[fgarciaq@emxys.com](mailto:fgarciaq@emxys.com)



Emxys contributes to JUVENTAS Cubesat , a part of ESA's HERA Mission, with GRASS gravimeter

EMXYS is an R&D company that designs, develops and produces integrated electronic systems for instrumented systems, data acquisition and control for aerospace and defence applications, providing specialised components and systems in R&D engineering.

#### TECHNOLOGICAL CAPABILITIES / PRODUCTS

Our experience in project management and systems engineering, combined with an intensive network of technological partners, enables us to offer our customers a unique interface to address complex problems.

EMXYS excels in:

- Creation of innovative and competitive electronic devices focused on customer needs.
- Management of multidisciplinary engineering projects acting as a technological partner, helping to overcome complex technical challenges.
- Development of complete space systems with background in demanding technology fields like spaceborne instrumentation, RF systems, optics, photonics...

#### MAIN PROJECTS

In recent years, one of the biggest challenges for the company has been the development of ODALISS, a complete nanosatellite platform designed around a sophisticated laser-based communications unit. This is EMXYS' first own product.

EMXYS proposes its patented ODALISS technology that enables point-to-point optical communications in free space from ground stations to satellites in a compact, efficient and small form factor. ODALISS consists of a complete nanosatellite platform designed around a sophisticated, laser-based communications unit capable of establishing communication data rates of 100 Mbps with optical ground stations (OGS), also developed by EMXYS as an integral part of the ODALISS project.



fentISS is a spinoff company of the Universitat Politècnica de València which offers software solutions for real-time embedded systems. The company has more than 10 years of experience in virtualization solutions and its products are mainly used in the space industry.

## TECHNOLOGICAL CAPABILITIES / PRODUCTS

fentISS' flagship product is XtratuM/NG (XNG), a hypervisor specially designed for real-time embedded systems to be safe, reliable, and efficient. The hypervisor provides a framework to run several operating systems in a robust partitioned environment.

Thanks to XNG, developers can build bare-metal applications or use different operating systems over the same platform, as well as to allocate applications with different criticality levels to each partition. The use of XtratuM/NG is convenient for systems in which the main challenges deal with safety, the reuse of certified applications, dynamic software updates and size, weight, power, and cost reduction of embedded safety-critical systems.

Additionally, fentISS has an entire set of software blocks which support the hypervisor, such as

LithOS, or RTEMS, real-time guest operating systems, as well as other development tools for scheduling, configuration, observability and integration.

XNG and several off these tools are currently orbiting in more than 750 satellites and instruments, being the most replicated Spanish software in space.

## MAIN PROJECTS

fentISS currently takes on the following space missions with XtratuM hypervisor running on them:

- **EyeSat Mission:** EyeSat is a 3U cubesat built as a pilot under the Nanolab-Academy project.
- **ANGELS Mission:** ANGELS (Argos Neo on a Generic Economical and Light Satellite) is the first nanosatellite designed and developed by French industry with support from CNES.
- **OneWeb Mission:** OneWeb is a satellite constellation developed to provide global broadband internet services to individual consumers. It offers internet services around the world through its 648 satellites to provide internet service to anywhere on Earth from space.
- **SWOT Mission:** The SWOT mission (Surface Water and Ocean Topography) is designed to make the first-ever global survey of Earth's surface water, collecting detailed measurements of how water bodies on Earth change over time.
- **JUICE Mission:** JUICE (JUperiter ICy moons Explorer) is an ESA's 3-years large-scale mission that will investigate the formation mechanisms of the Jupiter system and the necessary conditions for habitability.



GMV, a trusted partner for S/C manufacturers and operators, and space agencies, provides engineering, SW&HW development and systems integration. We have developed world leading capabilities in mission analysis, GNC, avionics, on board SW, robotics, satellite and mission control, flight dynamics, mission planning, fleet management, data processing and navigation.

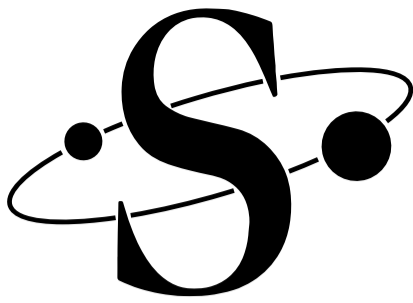
#### **TECHNOLOGICAL CAPABILITIES / PRODUCTS**

Involved in more than 900 satellite missions, we have a big portfolio of flight-proven products.

A worldwide leader in ground systems for telecommunications operators (Eutelsat, Hispasat, SES, Oneweb, Intelsat, Inmarsat... more than 40 operators worldwide). A recognized leader of ground control systems and data processing for Earth observation and meteorology (Earth Explorers, Copernicus, Paz, Microcarb, MTG, EPS SG), also a European leader of space surveillance (SSA and EUSST/STM) and a European reference in satellite operations engineering (DLR, ESA, CNES).

#### **MAIN PROJECTS**

Looking to our projects we can highlight our major responsibilities on the European satellite navigation programs Galileo and EGNOS, our presence in the commercial satellite telecommunications market (EUTELSAT, Hispasat, SES, Arabsat, Inmarsat, etc.), where we are recognized as the first worldwide ground segment provider, our strong commitment in Earth Observation and Meteorological programs for ESA (ESA Earth Explorers), EU (Copernicus), EUMETSAT (MTG and EPS SG), Spanish government (Ingenio/Paz), our major challenges on IOD missions (PROBA-3) or Robotics and Space Exploration (Exomars, MSR), our products and services around space safety and planetary protection (HERA, SSA, SST), our capabilities to provide operations support (DLR, ESA, CNES, Telecom operators) and finally our synergies to develop useful space applications (agriculture, security, forestry, maritime).



**Hydra Space**  
IOT SATELLITE CONNECTIVITY

[www.hydra-space.com](http://www.hydra-space.com)

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CEO

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pablo.durban@hydra-space.com

# Hydra Space.

## The clever satellite IoT project.

- Small size / weight**  
5 x 5 x 10 cm, ~400 grs.
- Compact design**, optimised and simplified architecture
- Minimal** manufacturing and launching costs
- 2-3y lifetime** in space (typ.)
- Graceful degradation**  
Zero space debris footprint
- No commercial parts**  
100% control over technology

### MULTIPLE APPLICATIONS

- Smart agriculture
- Infrastructure monitoring
- Fishery and ocean monitoring
- Logistics

HYDRA SPACE is start-up based in Madrid-Spain We provide satellite based IoT connectivity using a constellation of very small and affordable picosatellites and our own communications technology based on SDR paradigm.

We also work with 3rd party constellations to integrate our IoT payload in different satellite platforms.

Having developed one of the smallest albeit operational satellite platforms, we help partners and clients reach orbit in 6 months / 100k€ ROM budget to perform in orbit demonstrations, integrating small 3rd party payloads (hardware/software)

We fully control our technology, having the flexibility to integrate with 3rd parties and keep up with state of the art in satellite communications.

We have already launched 7 satellites, having participated in several space missions.

### TECHNOLOGICAL CAPABILITIES / PRODUCTS

- Small satellite platform design and manufacturing
- Satellite communications
- IoT communications
- Electronics, RF, critical software, mechanical design

### MAIN PROJECTS

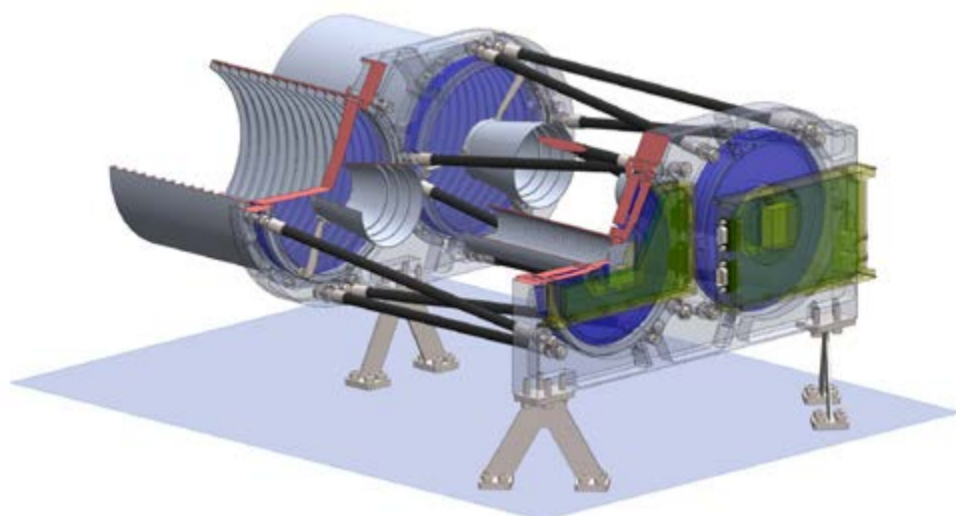
We have already launched 7 satellites with different launchers.

We integrated our system in Ariane 6 which will be launched end of 2023, as part of Young Professionals Satellite Project (YPSAT)

We are collaborating with Madrid UPM in UPMSAT3, a 12U cubesat which will be launched I 2024 by ISAR Aerospace

Part of Erminaz mission, to be launched in 2024 by RFA Aerospace (together with AMSAT-EA, AMSAT-DL and LibreSpace foundation)

Working with Universidad Carlos III (Madrid) in an R&D project to research the integration of space and terrestrial 6G networks.



IDOM is an international firm specializing in Engineering, Architecture and Consulting. IDOM operates globally in areas such as power generation, oil & gas, renewable and alternative energies, manufacturing industry, civil infrastructures, nuclear plants, large technological and scientific facilities, architecture and unique challenging engineering projects.

IDOM ADA leads the company activity in technologically advanced and challenging projects involving optics, mechanics, structural design, electronics and control for Astronomy, Space and Nuclear Research among other fields.

## TECHNOLOGICAL CAPABILITIES / PRODUCTS

- Earth Observing Cameras
- Laser Communication Terminals
- Pointing / Field Stabilization Mechanisms
- Mirror Units
- Telescope Mounts
- Acquisition, Guiding and Wavefront Sensing (AGWS) Systems
- Scientific Instruments and Instrument Stations
- Special Purpose Optical - Mechanical - Electronic Systems.

## MAIN PROJECTS

- iSIM 170/90 Earth Observation Cameras Optical Bench, Lens Mounts and Baffling System
- Ultra-low Profile Pointing Baseplate
- Quantum Key Distribution (QKD) Optical Ground Station
- Dynamic Optical Relay System (DORS) Fast Steering Mirrors
- Extremely Large Telescope (ELT) M6C / M6N Mirror Units
- Extremely Large Telescope (ELT) Acquisition, Guiding and Wavefront System
- Extremely Large Telescope (ELT) M1 Local Coherencer
- European Solar Telescope (EST) Mount
- Maunakea Spectroscopic Explorer (MSE) Mount
- Daniel K. Inouye Solar Telescope (DKIST) Enclosure
- ITER Core Plasma Thomson Scattering (CPTS) Diagnostic
- ITER Electron Cyclotron Heating (ECH) Upper Launchers.



**IENAI**  
SPACE

**ienai.space**

**Daniel Pérez Grande**  
CEO

danielpg@ienai.space



IENAI SPACE is a Spanish in-space mobility company working on breakthrough electric propulsion systems and a suite of software tools to help design, plan and optimize space mobility operations for micro-, nano- and pico- satellite platforms. The new space has seen an exponential growth over the past two decades, in which platforms with comparable functionality to traditional ones but with a greatly reduced size and cost are taking over the industry. Most of the applications require on-board propulsion for constellation deployment, station keeping, drag compensation, collision avoidance and de-orbiting. Unfortunately, Propulsion systems have not kept up with the industry's rate of miniaturization. Satellite integrators have painful dependencies with propulsion providers and knowledge barriers. To overcome this, IENAI SPACE is developing an end-to-end space-mobility ecosystem with both hardware and software solutions.

#### TECHNOLOGICAL CAPABILITIES / PRODUCTS

**Hardware solution:** ATHENA (Adaptable THrusters based on Electro spray powered by NANotechnology) is a customizable, modular, high-efficiency electro spray propulsion system. ATHENA is powered by externally-wetted multiplexed electro spray emitters using ionic liquids. This technology allows to tailor the propulsion system to the platform and mission by means of clustering, modularity and customization. On top of this it offers several advantages such as high efficiency, compact form factor, passive propellant feeding and inherent net zero current emission with bipolar operation.

**Software solutions:** to help design, plan and optimize space mobility operations. They comprise:

- GO (<https://ienai.space/go/>), a free-access, cloud-based tool that solves the «inverse problem» of mission analysis and will help you derive the preliminary requirements at phase 0.
- 360 by IENAI SPACE is a high-fidelity space-mobility and mission-analysis software, that allows to perform concurrent design and simulate operational environments through spacecraft mobility digital twins.
- ORBITAL is a streamlined scheduling software for propulsive phases.

#### MAIN PROJECTS

- GSTP Make: ATHENA Performance Model development
- GSTP Derisk: Innovative Electric Propulsion System with Variable Specific Impulse by Recuperating Energy - CASSINI IOD - ENDUROSAT IOD - 3CAT-8

## DRAGO uncooled space SWIR cameras for Earth observation



IACTEC is a space for technological and business collaboration created by the INSTITUTO DE ASTROFÍSICA DE CANARIAS (IAC), on the island of Tenerife (Spain).

The objective of IACTEC is to promote the transfer of IAC technology to the industry, and to favour the development of the technological industry in the Canary Islands. Created in 2016, IACTEC-Space is the program within IACTEC dedicated to the design and development of payloads for small satellites and instrumentation for space.

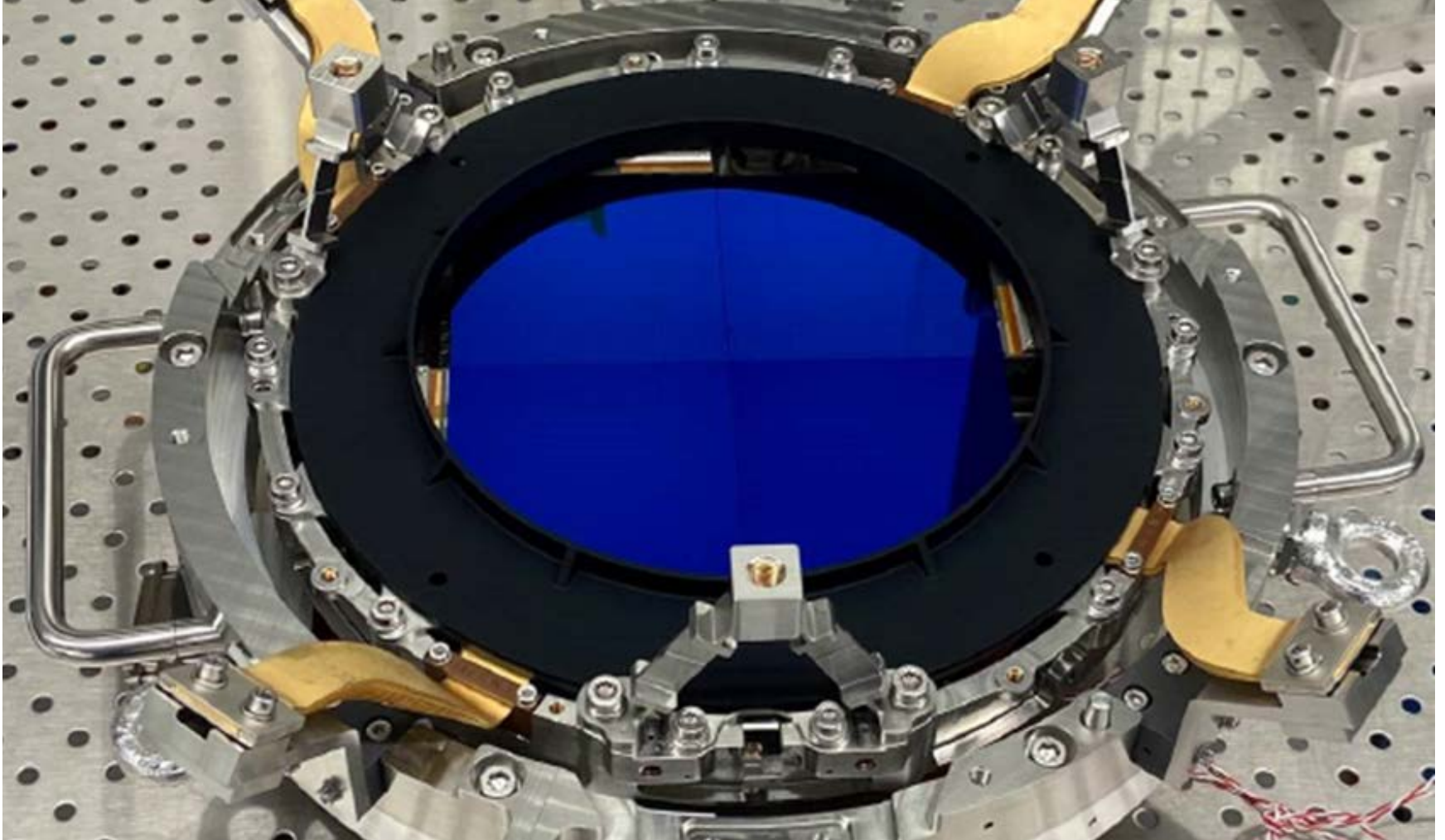
### TECHNOLOGICAL CAPABILITIES / PRODUCTS

The IACTEC-Space team is composed by 15 physicists and engineers dedicated to the design and development of payloads and instrumentation for small satellites, including optics, mechanics, electronics and software. The team also works on remote sensing and image analysis technics.

The IACTEC facilities are equipped with clean rooms and multipurpose laboratories where the team works on the design, development, integration and testing of the instrumentation.

### MAIN PROJECTS

- **DRAGO** (Demonstrator for Remote Analysis of Ground Observations). It is a series of cameras conceived to map the Earth in two observation bands in the short-wave infrared (SWIR) range: 1100 and 1600 nm. Their compact size, low weight and low power consumption allow them to be used in cubesats as small as 3U+. The applications of the DRAGO cameras include the monitoring of wildfires and volcanic activity, the analysis of desertification, the monitoring of water stress in crops or the evaluation of the impact of floods.
- **VINIS**. A high-performance Earth-observation payload in the visible, near-infrared and short-wave infrared (from 400 nm to 1700 nm). With an effective aperture of 200 mm, it will achieve a Ground Sampling Distance (GSD) of 5 m per pixel and a swath of around 6.5 km, for a 500 km orbit.
- **ALISIO-1**. The first Canary Islands satellite for Earth observation. The satellite will host a DRAGO-2 camera and a laser optical communications module for the transmission of data to the ground. This satellite will be launched to space next year 2024.
- **IACSAT-1 space telescope**. The first space astronomical observatory of the Instituto de Astrofísica de Canarias, which will be used for the confirmation of new Earth-like exoplanets and the study and monitorization of near-Earth asteroids. It will consist on a ~22 cm mirror telescope, operating in the visible and near-infrared. This telescope is currently under development.



LIDAX is a space technology group founded in 2000.

The mission of the group is to develop new products through the engineering and breakthrough technologies that contribute to improving people's lives, sustainable development and expanding the scientific knowledge of humankind.

The engineering, facilities and production processes are traditionally carried out by LIDAX Ingeniería, from design to the delivery of integrated, tested and qualified equipment mainly focused in developing advanced opto-mechanical and cryogenic equipment.

As result of the new strategic vision, a new subsidiary, LIDAX Electro-Optical Systems, has been created to develop and commercialize electro-optical systems such as custom cameras (covering from IR, VIS to UV wavelengths) and space LIDARs, for various space application needs demanded by our customers.

LIDAX Group's infrastructure and internal processes are implemented to carry out the serial production of space products (industrialization).

The portfolio of products and services includes:

- Optical Units (Lens Objectives / Telescopes / Optical Heads)
- Cryogenic Systems
- Technical Services
- Product Industrialization
- Thermal Testing
- Metrology

In a fully integrated and equipped center of 1.800m<sup>2</sup>, LIDAX concentrates the development office for design and engineering activities, the assembly, integration / clean room areas (ISO5 & ISO 7), the thermal testing laboratory (e.g., x2 Bake-Out Chambers, Cryostat) & metrology equipment (e.g. CMM, Interferometer / Autocollimator).

## TECHNOLOGICAL CAPABILITIES / PRODUCTS

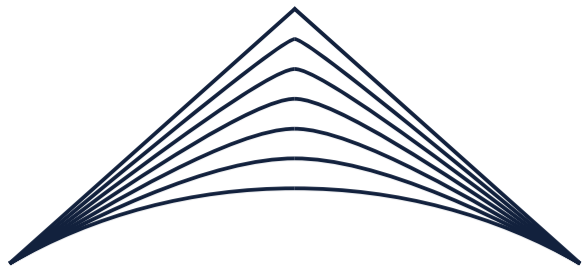
Relevant Capabilities for space equipment development

- System Engineering
- QA & Product Assurance
- Product Development
- Optical Design
- Opto-Mechanical Design
- Thermal & Structural Analysis
- Assembly Integration & Testing Engineering
- Assembly & Integration in Cleanroom ISO 7/5 – Coordinate Measurement Machine
- In-house (Vac.Oven) & nearby Testing Facilities (TVC, Vibration)
- Industrialization Processes for serial HW production

LIDAX has a network of specialized partner companies in space electronics for product development.

## MAIN PROJECTS

- [ESA] PLATO Payload Focal Plane Assembly (FPA) Thermo-mechanical elements QM and FMs (2022-2023)
- [ESA] Imaging LIDAR for Space Applications (2021-2022)
- [IAC] Laser Launch Telescope for a Laser Guide Star (2020-2022)
- [ESA/INTA] Development of EXOMARS RAMAN Instrument: iOptical Head Thermo-Mechanics Laser encapsulation box & Autofocus Mechanism (2014-2019)
- [ESA/THALES] Development of FCI& IRS Telescope Optics for MTG Satellites Series. Optical Mounts and Environmental Test Campaign 24 Units delivered (2013-2020)
- [ESA/AIRBUS D&S] Development of Co-alignment Sensor ATLID Earthcare Satellite. Thermomechanics (2012-2017)
- [ESA/INTA] Focal Plane Assembly for BEPICOLOMBO Satellite MIXS-T & MIXS-C. Thermo-Mechanics, (2007-2015).
- [ESA/INTA] Focal Plane Assembly for PLATO Cameras. Thermo-mechanics (2008-2020)
- [ESA/INTA] James Webb Space Telescope Mid-IR Instrument Simulator (MTS). 4 Cryogenic Folding Mirror (2008-2009).

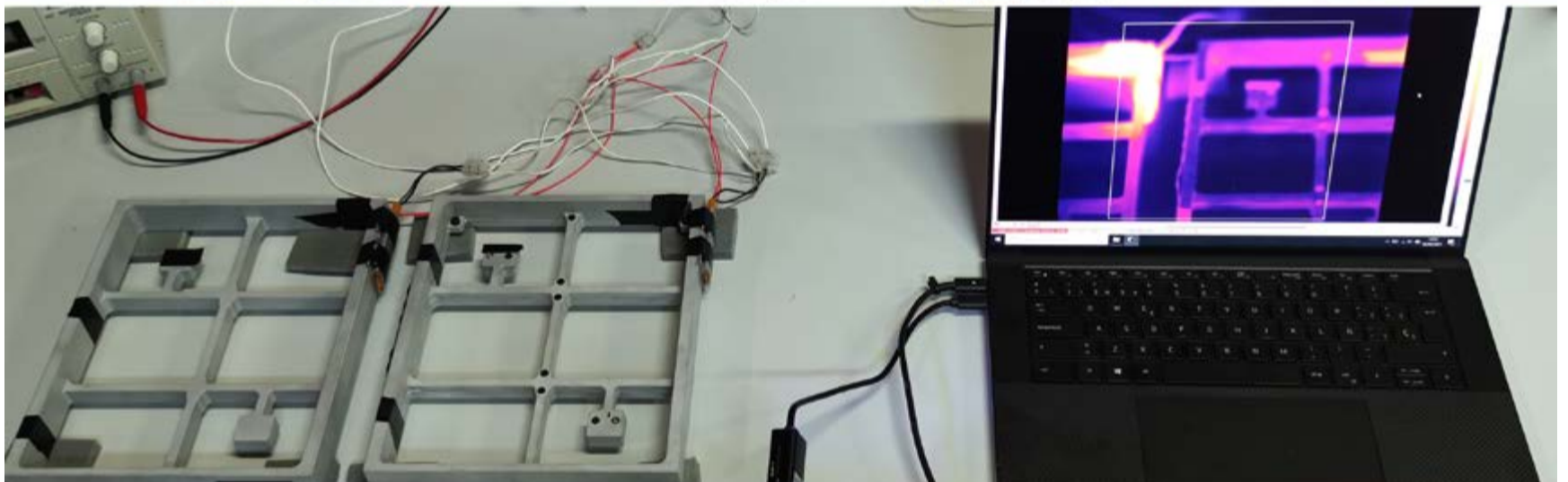
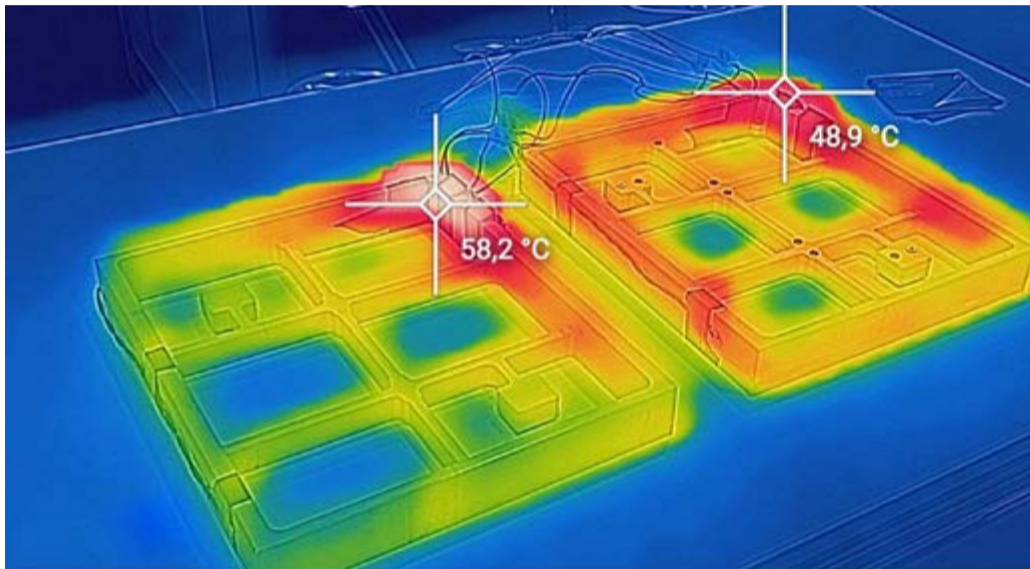


madridspace

[www.madridspace.eu](http://www.madridspace.eu)

**David Orgaz Díaz**  
CEO

[d.orgaz@madridspace.eu](mailto:d.orgaz@madridspace.eu)



MADRID SPACE is your prime choice for expert support in Thermal, Structural and CFD services in the Space Industry.

We are the right technological partner of those companies who face technical challenges, providing them with powerful solutions to surpass their limits, from the early stages of the project until the in-orbit operations.

#### TECHNOLOGICAL CAPABILITIES / PRODUCTS

- Thermal modelling & analysis of any kind of equipment/ subsystem: electronic components, mechanisms & complete platforms, using ESA standard tools and powerful in-house software.
- Mechanical design and analysis, including typical launch environment (QSL, sine, random, shock), acoustic analysis, and topological optimization for traditional and additive manufacturing methods.
- CFD simulations, including atmospheric re-entry, modelling of propulsion systems and heat transfer conjugate models.
- Development and delivery of multifunctional structures, optimized from the thermal and mechanical perspective.

#### MAIN PROJECTS

Madrid Space has collaborated in more than 50 projects since 2016, including:

- G2G (Galileo 2nd Generation)
- PLATO
- JUICE
- Europa Clipper
- Space Rider
- Solar Orbiter
- Several experiments on board the ISS

Besides that, the company develops its own technology:

THEAMS (Thermally Enhanced Additively-Manufactured Structures)



We manufacture high precision mechanical components for the space field.

If your parts are highly demanding or critical in terms of geometry and dimensions we are your perfect fit. That's the kind of parts we like. MICROLAN aerospace "is" passion for precision. We make parts others can't do. With high precision and cost effective.

#### **TECHNOLOGICAL CAPABILITIES / PRODUCTS**

CNC turning, CNC milling, 5-axis continuous machining, multitasking machining, grinding, shot blasting, vibratory drums, chip briquetting.

Automations, IOT, flexible manufacturing cells, measurement during manufacturing by Renishaw probe, laser marking, correlative marking for traceability of the production process.

CADCAM design and programming,

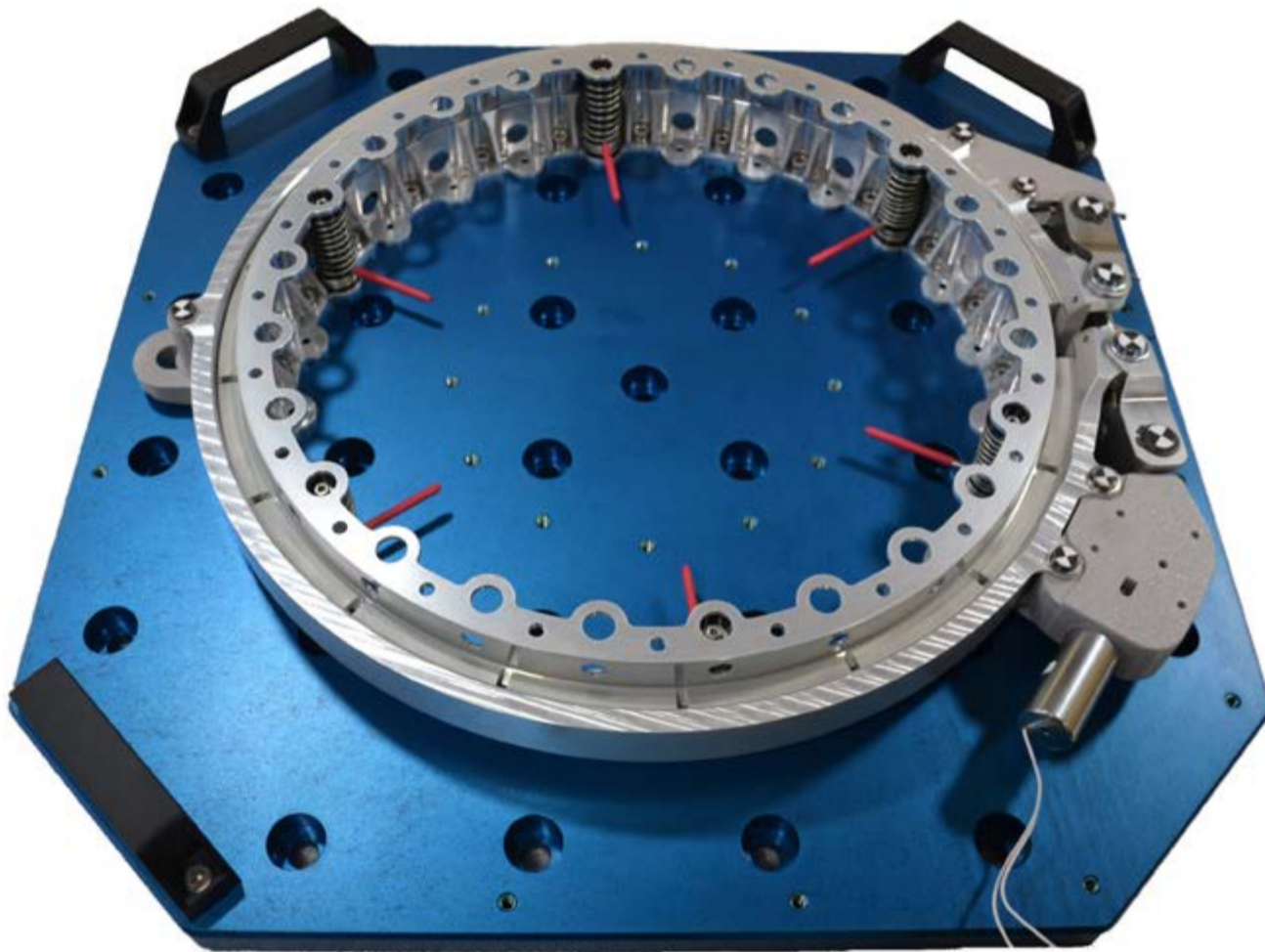
Temperature control of the manufacturing and measuring area. Measurement by 3D coordinate machines, endoscopic probe for analysis and deburring of joints between holes.

Tool management (management software, balancing machine, intelligent stock management, tool press-setting, thermal clamping).

We are certified under ISO 9001 and EN 9100 standards.

#### **MAIN PROJECTS**

- SPAINSAT NG III
- GALAGO
- PROSPECT – EHDM & IHDM
- COMET 800
- HERA-IPU
- AIRBUS A440M
- AIRBUS A330 MRTT
- AIRBUS A320
- AIRBUS A350
- AIRBUS A380 CARGO



OCCAM Space is a Spanish company located in Madrid with 100% independent capital.

The company is focused on space mechanisms and separation systems for Smallsats and the NewSpace market to provide reliable and competitive products.

OCCAM Space designs, manufactures and tests all their products.

#### **TECHNOLOGICAL CAPABILITIES / PRODUCTS**

OCCAM Space provides the following services:

- Structures & Mechanisms
- Separation Systems & Adapters
- Design, Manufacturing & Testing
- Engineering
- Consulting
- Ground Support Equipment

The company has started its activity with the development of a Separation System for Small satellites, named KISS “Keep Simple Separation-system”.

#### **MAIN PROJECTS**

The personnel and investors of OCCAM Space has more than 80 years of experience in the Space sector, having worked in some of the most relevant companies in Spain and worldwide, Participating in missions such as Sentinel 4, Sentinel (1B, 1C, 1D, 2A, ...), EDRS-C, Euclid, SARah, ELECTRA, Beresheet Lunar Lander, Brisat, Bsat 4A, Bsat 4B, Intelsat 38, Amazonas 5, Hispasat 1F, Eutelsat 7C, Intelsat 39, Ovzon, Galileo Dispenser, Eurostar 3000, Exomars-Rover, Space Rider, between many other missions.



PROSIX ENGINEERING, S.L. (2006, San Sebastian, Spain. Private Company) is a specialized engineering company focused on fibre reinforced plastics (FRP) and thermoset matrices. PROSIX offers comprehensive engineering services that include primary FRP material research, FRP materials properties modification and qualification for specific environments (high temperature, cryogenic, high vacuum, radiation...), definition, testing and validation of manufacturing procedures, part and mould design, costs analysis, prototype and series production and quality control (mechanical and chemical testing, NDT and SHMS).

PROSIX has an extensive knowledge on OoA pre-preg manufacturing procedures and resin injection/infusion process due to its intensive experience on the composites sector and the wide range of R & D developed programs. It develops its projects in every industrial sector for those that regularly use composites, as well as for potential users. The purpose of PROSIX is to reach the optimal level of composites usage in every single project.

#### TECHNOLOGICAL CAPABILITIES / PRODUCTS

PROSIX facilities are located in San Sebastián, Spain offering the following list of manufacturing facilities:

- CFRP materials processing land and R&D lab
- Matrix processing area
- Sanding/cutting area
- 2 testing curing ovens 1,5x1.2x0.8 m
- 1 main curing oven 3,5x3,5x1.8 m
- Freezer warehouse
- Controlled Environment lamination area
- Controlled Environment assembly and metrology area
- Technical office

#### MAIN PROJECTS

- Assembly of space cfrp structures with racing sailing boats technology (ESA-ITI A/B A00011082, B00013062): in cooperation with COMET
- Design and manufacturing procedure development for CFRP pressure vessels for small size space launchers
- Design, manufacturing, testing and validation of an internal CFRP tension net for a 4m diameter Large Deployable Reflector (LDR) based on ESA 568 patent. In cooperation with COMET
- ITI 4000114438/15/NL/CBi/GM “ Passive Damped Deployment of Full Composite Structures “In cooperation with COMET and AIRBUS DS
- ESA project MODULAR DEPLOYABLE STRUCTURES 4000116156/15/NL/PS. In cooperation with COMET and AIRBUS DS. During this project, two large deployable structures have been successfully developed and tested, reaching TRL4: a large deployable mast of 10 m long and a large deployable ring of 6 m diameter, with a representative cable network. Both structures are composed of CFRP struts. In an additional CCN of this contract has been done in order to preliminary design large deployable reflectors for missions CIMR and ROSE-L. In the frame of that contract, a second CCN 4000116156 has been also developed including a new full operative cable network and a representative surface metal mesh.
- M&P developments for AIRBUS DS Spain internal R&D projects

- Development and validation of a full CFRP C-band corrugated horn (Sener)

- ITI PHASE B- AO/1-8876/17: “Passive Damped Deployment of Full Composite Structures”. In cooperation with COMET and AIRBUS DS

- Under current development: NanoMagSat Risk Retirement Activities, 1000032321 3m Deployable boom and optical bench for magnetometer+star cam system

- Under current development: 4000130171/20/NL/AS MODAR, Deployable Reflector Antenna for CubeSat Missions. In cooperation with COMET

- Under current development: INNOVATIVE LARGE FLEXIBLE REFLECTORS (REF-FLEX) 4000134683/21/NL/GLC/vr In cooperation with Airbus DS and Comet.

- IN16-B High accuracy CFRP neutron reflector 3m dia. structures development, manufacturing and validation. In cooperation with AVS

- Design and qualification of optical fibre positioner ends for the GTC spectrometer

- CFRP liquid Scintillation Detector development and qualification, in cooperation with AVS

- Optical fibre based detector development and manufacturing for high-pressure neutron diffraction studies, in cooperation with AVS

- CFRP neutron vacuum guides and connectors development and qualification, in cooperation with AVS

- High vacuum optical degree epoxy system development and qualification for high vacuum and high radiation ambient

- Under current development Miracles High accuracy CFRP neutron reflector 2m dia. structures development, manufacturing and validation. In cooperation with AVS

- Under current development ATLAS detector CFRP petals second version development and manufacturing (CERN) in cooperation with AVS

- Development, manufacturing and qualification of Ku and Ka subsea radomes for 70 bar (INDRA)

- Development of construction procedures for out of autoclave pre-pregs materials to achieve autoclave cured pre-pregs

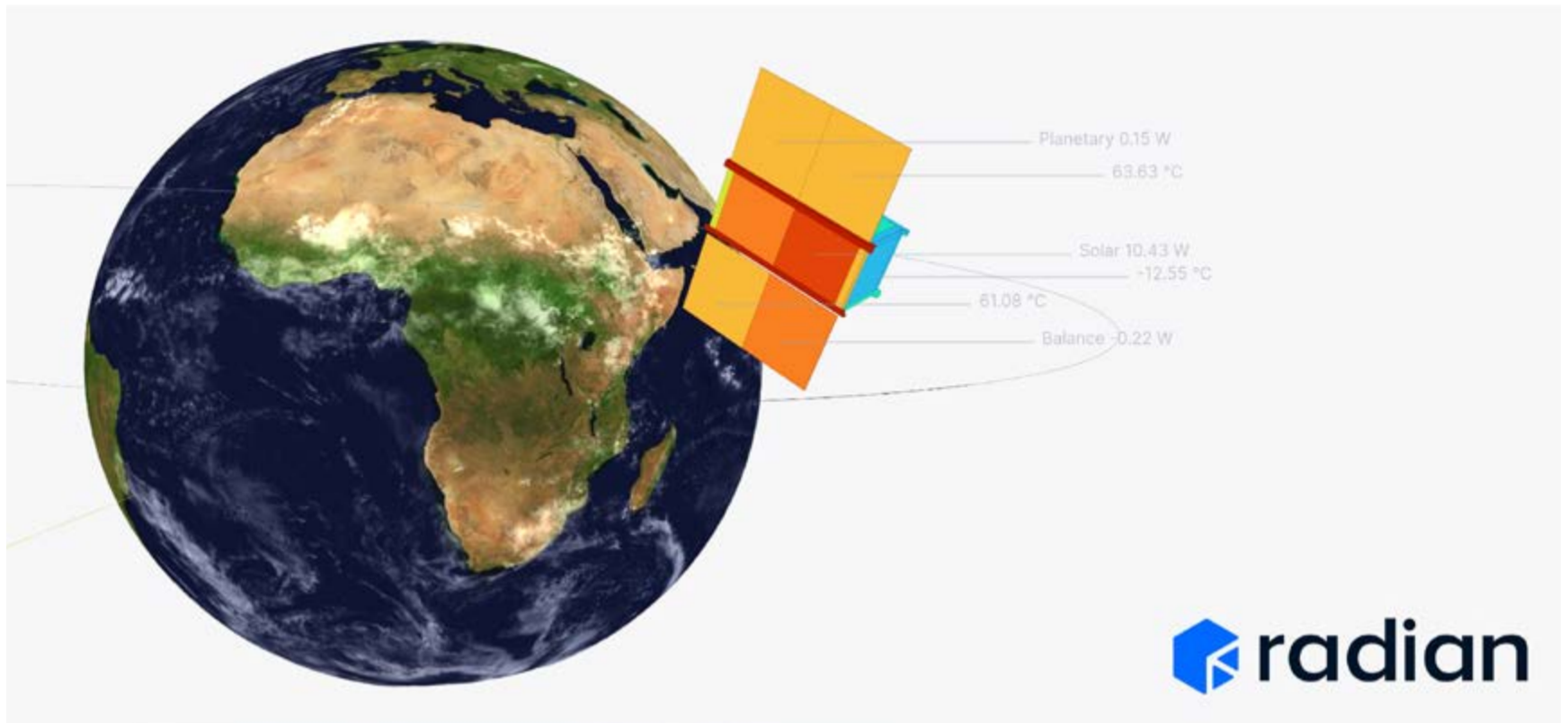
- Construction of high performance sailing boats for the America’s Cup, Sailing Around the world races and extreme oceanic sailing challenges (Desafío Español ACC boat 1 and 2 for the 32° Americas Cup challenge, 5 units of Tp 52` , VOR 70 “Telefonica Blue” for the Volvo Ocean Race, The Artemis Team Flying catamaran 1 and 2 for the 34° Americas Cup challenge, VOR 70 “Movistar” for the Volvo Ocean Race)

- Development of construction procedures for out of autoclave pre-pregs materials to achieve autoclave cured pre-pregs materials porosity level

- R&D of integration strategies for Bragg grating (optic fibres) into composites parts for the structural health monitoring of the composites structures

- Development of automatic manufacturing procedures for the wind blade automatic manufacturing machine

- R & D of sensorized composites repair patches for military aircraft application (INTA).



RADIAN provides space thermal analysis software conceived to deliver agility to engineers, both at modelling and computing processes. Our software is accessible through a regular web browser and counts on a scalable network of computing resources in the cloud.

**We offer solutions to:**

- Satellite developers and integrators, with a more intuitive tool, simple workflow and faster modelling.
- Universities, as a tool to learn about thermal analysis complementing theory lessons and for Cubesat projects.
- Part Suppliers, who can showcase their components in our catalogue and increase their exposure.

**TECHNOLOGICAL CAPABILITIES / PRODUCTS**

The underlying simulation engine reproduces the orbital environment and the thermal solution. Detection of penumbra, multibody eclipse, or telescope pointing are some of the featured aspects of the simulated conditions, all validated against GMAT. Thermal models are based on lumped-parameter networks, linked by conductive couplings (supported by contact detection), and radiative couplings (computed by Monte Carlo ray-tracing). Dissipative loads may also be thermostatic, recreating the behavior of heaters.

Users can import their 3D models from other CAD packages or create them in RADIAN's software, with support of the Databank, a catalogue of satellite components, modelled materials and surface treatments, orbits, and attitude configurations. The Databank enables rapid importing and reusing of modelled components, and access to COTS parts from manufacturers. Importing and exporting thermal models compatible with other tools is also possible, thanks to the support of the Thermal Analysis & Software group at ESA/ESTEC.

**MAIN PROJECTS**

ESA BIC Madrid.



SATELIOT is launching the first LEO satellite constellation based on the 5G standard, allowing commercial unmodified cellular IoT devices to connect from space. This is the first time in history that cellular terrestrial telecom is merging seamlessly with satellite connectivity and SATELIOT is leading this revolution. SATELIOT's cost-effective technology and the possibility to use commercial low-cost devices to connect to satellite opens infinite possibilities on the untapped market of massive IoT in remote areas, and it is in line with SATELIOT's mission to make IoT connectivity available everywhere and to everybody.

#### **TECHNOLOGICAL CAPABILITIES / PRODUCTS**

##### **Regenerative Payload 5G NB-IoT NTN for LEO with Store&Forward function**

Rural and offshore regions lack of cellular network coverage, limiting technological and social progress in these communities and inhibiting new business opportunities. To tap into the IoT market in these areas, a cost-effective satellite solution is required to provide low-cost devices and connectivity. As a solution the 3rd Generation Partnership Program (3GPP), sponsored by SATELIOT proposals, has introduced support for the 5G standard of Non-Terrestrial Networks (NTN). The utilization of a standard solution enables economies of scale, fostering market expansion and cost reduction.

Delay-tolerant IoT applications situated in the rural and offshore regions –such as smart agriculture, livestock, and asset tracking– can benefit from a cost-efficient deployment of a Low-Density Low Earth Orbit (LEO) satellite constellation. Despite the simplicity of this constellation type, the Low-Density nature introduces challenges due to service link discontinuity. Moreover, the feeder link connecting the satellite constellation and ground stations is accessible only at limited locations. This becomes especially critical because terrestrial network elements within the mobile network remain constantly interconnected, facilitating the exchange of control and user information. Hence, adapting the 5G mobile network operation to accommodate service and feeder link discontinuity necessitates the adoption of a regenerative payload architecture that supports a store and forward mechanism. This mechanism is crucial in both the user and control planes. In the former, data from delay-tolerant IoT applications is transferred and stored on the satellite during its passes, which is then forwarded to ground stations. In the latter, special adaptations of the 3GPP procedures are required, as timers and signaling procedures are not suited for link discontinuity, such as the attached procedure required to connect user equipment to the mobile network.

##### **Core Net adapted to LEO**

To tailor the 3GPP network architecture for the store and forward functionality, the core network is divided into two parts. One part is hosted on the satellite's regenerative payload, and the other part hosted on the ground. The regenerative payload provides the necessary processing for hosting the eNodeB and Mobile Mobility Entity (MME), required to complete core network signaling on the satellite and allow User Equipment (UE) registration on the network. The satellite core network (SAT-CORE) is linked to the ground core network (GND-CORE) using

a specialized set of store and forward proxies. These proxies are designed to support both user data and signaling procedures, with a particular focus on the authentication procedure, which requires several message exchanges between the UE and Home Subscriber Server, especially in scenarios where roaming is involved.

##### **Roaming Interface over IPX**

SATELIOT's mission is to make IoT connectivity universally accessible, providing a cost-effective solution. Given the high operational cost of a satellite constellation, it's ineffective for each mobile network operator to launch their own constellation. Consequently, SATELIOT's solutions support roaming through standardized Roaming Interfaces over IPX. The IPX network aims to simplify interconnections between Service Providers, enabling any mobile network operator to extend their coverage by allowing their users to roam on SATELIOT's network. This approach empowers mobile network operators to offer new services to their users without requiring infrastructure deployment, relying on a standard roaming agreement with SATELIOT.

##### **Deployment on AWS**

As mobile networks are virtualized, SATELIOT's infrastructure is deployed on Amazon Web Services (AWS). This choice allows for first-class infrastructure with scalability and enhanced availability.

In conclusion, addressing the connectivity gaps in rural and offshore regions through innovative satellite solutions holds the key to unlocking technological advancement and economic growth in underserved markets. By embracing the 3GPP-supported 5G standard for Non-Terrestrial Networks, specially using a Low-Density Low Earth Orbit satellite constellation as proposed by SATELIOT, can pave the way for a new era of IoT applications and services. The adoption of regenerative payloads, store-and-forward mechanisms, and standardized roaming interfaces demonstrates the commitment to bridging the digital divide and making IoT connectivity accessible to all. With a solid foundation built upon these principles and the deployment of SATELIOT's infrastructure on AWS, the vision of ubiquitous IoT connectivity becomes not only plausible but also an achievable reality, fostering progress and inclusivity in even the most remote corners of the world.

#### **MAIN PROJECTS**

SATELIOT is currently partner of three European projects, namely cubesat for Quantum and 5G communication (QUANGO), Quantum Devices and subsystems for Communications in Space (QUDICE) and self-evolving terrestrial/non-Terrestrial Hybrid networks (ETHER). The objective of QUANGO (GA N. 101004341) is to enable the combination of quantum key distribution and 5G to reduce the cost of both services by sharing the satellite infrastructure. In QUDICE (GAN. 101082596), the objective is the integration of quantum key distribution into space communication. The ETHER (GA N. 101096526) objective is to develop solutions for a unified radio access network and for energy efficient, AI-enabled resource management across terrestrial, aerial and space domains while creating the business plans driving future investment.



SATLANTIS is a Space Technology Company for Earth & Universe Observation; a user-driven organization providing reliable and innovative Full Satellite Solutions built around customizable High and Very High-Resolution optical payloads.

With strategic partners, SATLANTIS provides Full Solutions for Small Satellites by controlling its own optical channels embarked in agile small sensor buses, operated in intelligent missions that generate unique customer proprietary data, capturing critical spectral information through software, hardware, and services for remote sensing applications.

The Company headquarter is in Bilbao, Spain, within the University of the Basque Country Science Park. SATLANTIS has a subsidiary in the U.S., SATLANTIS LLC, based within the Innovation Hub, at the University of Florida, Gainesville, and a subsidiary Company, SuperSharp, based in Cambridge, UK.

## TECHNOLOGICAL CAPABILITIES / PRODUCTS

SATLANTIS offers a high-performance set of innovative Earth and Universe Observation technologies to answer the growing demand of geo-requirements such as following irregular geometry on Earth and spectral needs at international level, providing integrated satellite solutions built around its customizable High and Very High-Resolution optical payloads.

The core technology, developed by the Company, is the optical payload iSIM (integrated Standard Imager for Microsatellites): Very High-Resolution and miniaturized cameras for Earth Observation operating onboard Small Satellites, with proven flight heritage of the flight models iSIM-170 and iSIM-90 (In-Orbit Demonstrations from the ISS).

SuperSharp is an Earth-imaging company developing unfolding space telescopes to capture high-resolution thermal infrared (TIR) images of the Earth. Their technology allows them to fit a large telescope in a small satellite, making low-cost, high-resolution, and frequent Earth-imaging possible. This makes powerful TIR space telescopes much more affordable while achieving 4x greater resolution per unit cost than the current state-of-the-art solutions.

SATLANTIS, together with SuperSharp, cover the whole range of the light spectrum from high-resolution visible (VIS) and short-wave infrared (SWIR) to long-wave infrared (LWIR).

Through the innovative upstream microsatellite technologies for EO vertical services, SATLANTIS' Very High-Resolution optical payload can be used for different applications, such as detection and quantification of methane emissions, defence and intelligence and monitoring of critical infrastructure.

## MAIN PROJECTS

SATLANTIS' main EO Missions currently are:

- In-orbit demonstration of iSIM-170 launched to the ISS within a JAXA mission (Q2 2020)
- In-orbit demonstration of iSIM-90 launched to the ISS within CASPR mission for NASA / DoD in collaboration with SHREC (Q4 2021)
- First iSIM-SAT 16U-CubeSat End-to-End solution mission (Q2 2022)
- GEI-SAT Precursor mission: launch of second ISIM-SAT 16U CubeSat + iSIM-90 VNIR-SWIR (Q3 2023) to be followed by Constellation of 3 MicroSats scheduled for between Q3 2024 and 1 MicroSat in Q3 2025) dedicated to CH<sub>4</sub>/GHG & Environment SATLANTIS' main EO Missions currently are:
- In-orbit demonstration of iSIM-170 launched to the ISS within a JAXA mission (Q2 2020)
- In-orbit demonstration of iSIM-90 launched to the ISS within CASPR mission for NASA / DoD in collaboration with SHREC (Q4 2021)
- First iSIM-SAT 16U-CubeSat End-to-End solution mission (satellite launch Q2 2022)
- GEI-SAT mission: launch of second ISIM-SAT 16U CubeSat + iSIM-90 VNIR-SWIR (Q3 2023), a Precursor to be followed by GEI-SAT Constellation: 3 MicroSats for methane measurements with satellite data (scheduled for 2025-26)
- Mantis: iSIM-90 VNIR + Mission for Oil&Gas ESA Launch of a 12U-CubeSat (Q4 2023)
- HORACIO, launch of iSIM-SAT 16U iSIM-90 VNIR SWIR (Q1 2024)
- 2 x GARAI, launch of iSIM-SAT MicroSats iSIM-170 & iSIM-90 VNIR-SWIR (Q4 2024)
- Participation in ARRAKIHS ESA Scientific Mission with an adapted iSIM for University exploration (2030).

SuperSharp is currently developing a space rated version (TRL 6) of their unfolding telescope to be delivered by December 2023 under a UK Defence and Security Accelerator (DASA) contract. They are planning an In-Orbit demonstration of the telescope in 2025.



We provide reliable in-space logistics, rideshare and dedicated launch services for Small Satellites, from LEO to the Moon and beyond.

UARX Space provides in-space transportation and launch services for CubeSats and the Small Satellite industry. Founded by Yanina Hallak and Andrés Villa, both CalPoly alumni, the University known worldwide for being the home of the CubeSats. The UARX Space Team is formed by an interdisciplinary team of professionals with different backgrounds and experienced aerospace, electronics, and mechanical engineers with experience designing Earth observation and Geostationary satellites, scientific Earth observation missions, and payload instruments for deep space. The team expertise includes developing satellites from 1 Kg to 3500 Kg and the areas of expertise include critical onboard software, structural analysis, CDH, mass memory, thermal analysis, project management, systems engineering, assembly, integration, and testing, and operations. The company headquarters is located in Nigrán, Galicia, Spain.

## TECHNOLOGICAL CAPABILITIES / PRODUCTS

### Launch Service

We offer world-class services to help your spacecraft reach traditional and non-traditional orbits, from Low Earth Orbit, to the Moon and beyond. In addition, we work with industry leaders launch vehicle providers that can accommodate different payloads, either a CubeSat, a PocketQube, a Small Satellite, or just an experiment that needs to reach orbit as a demonstrator.

### Engineering Services

- Mission Analysis
- Formal Peer Reviews
- Space System Engineering
- Thermal Analysis
- Power Analysis
- Structural and Stress Analysis

## MAIN PROJECTS

TOM (To Orbit Mission) is the simplest access to space that we have. It is highly configurable, allowing us to deploy the different types of small satellites to the initial orbit where the rocket arrives.

OSSIE (Orbit Solutions to Simplify Injection and Exploration) orbital transfer vehicle (OTV). OSSIE is capable to transport up to 400kg of CubeSats and other small satellites and utilizes green propellant thrusters to transfer its payload to the target orbits. After launch into a traditional LEO orbit, OSSIE's customers can be injected into a variety of orbits including GTO and Lunar transfers.

The Reliable and Advanced Mission Injector (RAMI) is designed to support long duration missions and therefore incorporates communication and power supply ports for the CubeSats. In order to support the most advanced CubeSat systems RAMI can accommodate protrusions between 15mm and 20mm beyond the CubeSat walls.

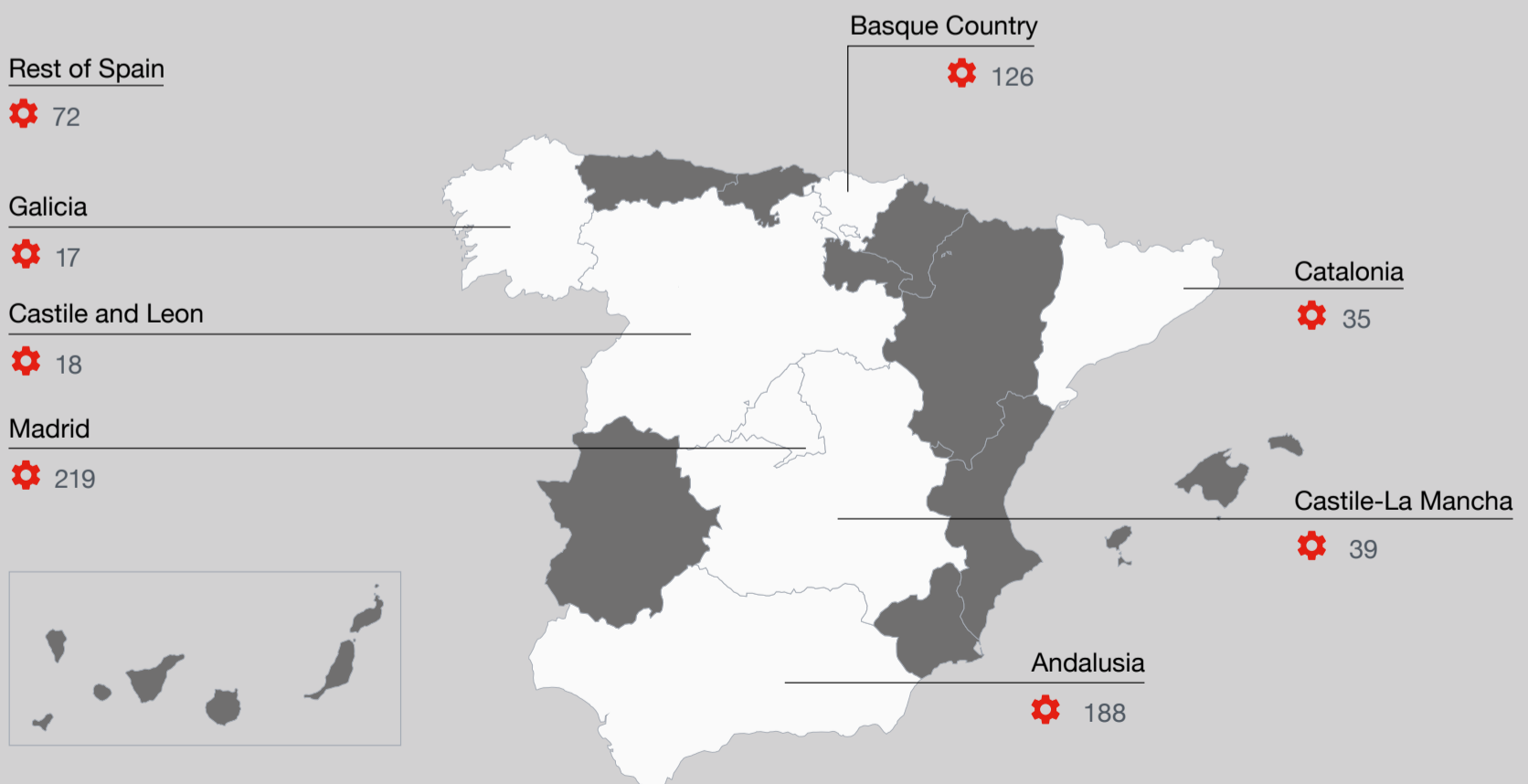
Lunar Cargo Services (LUCAS) vehicle to deploy spacecraft in orbits around the Moon and it is designing OTV concepts for interplanetary missions.

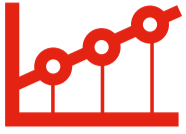
LOLA (Landing Opportunities for Lunar Activities) intends to generate opportunities for the future of lunar exploration. It will allow the delivery of payloads and instruments developed to perform "in-situ resources utilization" on the Moon.



# Why Spain for *Aerospace?*

- ✓ Spain's aerospace industry is highly developed.
- ✓ Spain ranks 4th in the EU in sales (€ 12.48 billion in turnover in 2022) and people employed (more than 53,600).
- ✓ It is a fast-growing industry that invests heavily in R&D (10% of its total turnover).
- ✓ The Spanish aerospace industry boasts major clusters, including many major infrastructures, research centres, science parks and highly qualified and experienced human resources.
- ✓ In total Spain is home to 714 aerospace production centres.





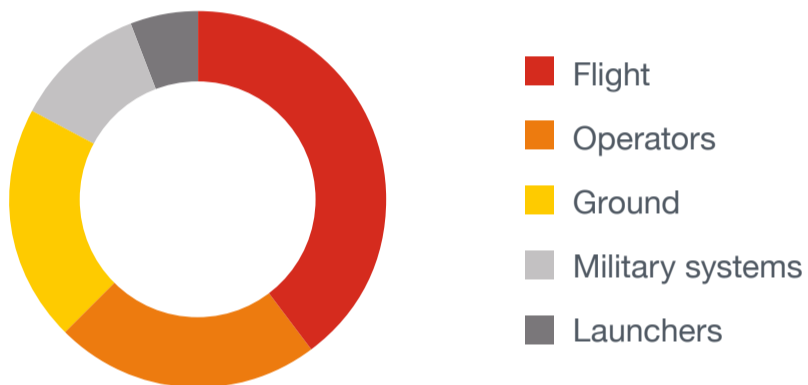
# Facts & Figures

## SPACE INDUSTRY IN SPAIN

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- The Spanish space industry ranks **4<sup>th</sup> in the European Union** with a turnover of €1.075 million (2022) and almost 6.000 direct employees.
- Exports worth 80% of the total Space turnover
- Represents almost 1% of Spain's industrial GDP and invests heavily in R&D (10% of its total turnover)

Segments distribution



- The Spanish space industry has evolved enormously and **grown in the added value** chain to become subsystem prime, ground segment prime and satellite & mission prime.
- **Technology** designed, developed and manufactured by Spanish space companies is flying in hundreds of space missions.
- **Spain is a founding member of ESA** (the European Space Agency) and takes part in its main programmes. Companies are also involved in other national, European and multilateral space industry programmes.

## MAIN PUBLIC INFRASTRUCTURES IN SPAIN

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### ESA

ESAC (European Space Astronomy Center) in Villafranca del Castillo (Madrid): tracking station.  
Estación de Cebreros (Ávila, Castilla y León): deep space network.  
ESA BIC.

### EU

EUSC (European Union Satellite Center, SATCEN), Torrejón de Ardoz (Madrid).

### NASA

Madrid Deep Space Communications Complex - Robledo de Chavela (Madrid).

### INTA - National Institute of Aerospace Technology

Madrid centers: SPASOLAB ESA, CAB NASA (Astrobiology Center), etc.  
Space Station in Maspalomas (Canary Islands).  
Test Center in El Arenosillo (Huelva, Andalusia) .

## Organizer



[www.icex.es](http://www.icex.es)

ICEX Spain Trade and Investment is a public business organization which works worldwide with the objective of promoting the internationalization of Spanish companies in order to improve their competitiveness, as well as boosting foreign investment in Spain. ICEX offers its services through 31 Provincial and Territorial Trade Offices in Spain, 98 Economic and Commercial Offices worldwide, the largest foreign network, and 29 Business Centres abroad. Every year, ICEX organizes around 1,200 promotional activities in foreign markets and answers over 90,000 queries on internationalization.

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## In collaboration with:



[www.aee.gob.es](http://www.aee.gob.es)

The mission of the SPANISH SPACE AGENCY is to provide a unified national space policy, and to guarantee effective strategic action of the Spanish government in the space sector by effectively coordinating national services and activities. It is also the point of contact with other national and international space agencies, and acts as a node for public-private collaboration, supporting existing aerospace companies and fostering the creation of new players in the sector.

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**Organizer:**



**ICEX**



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