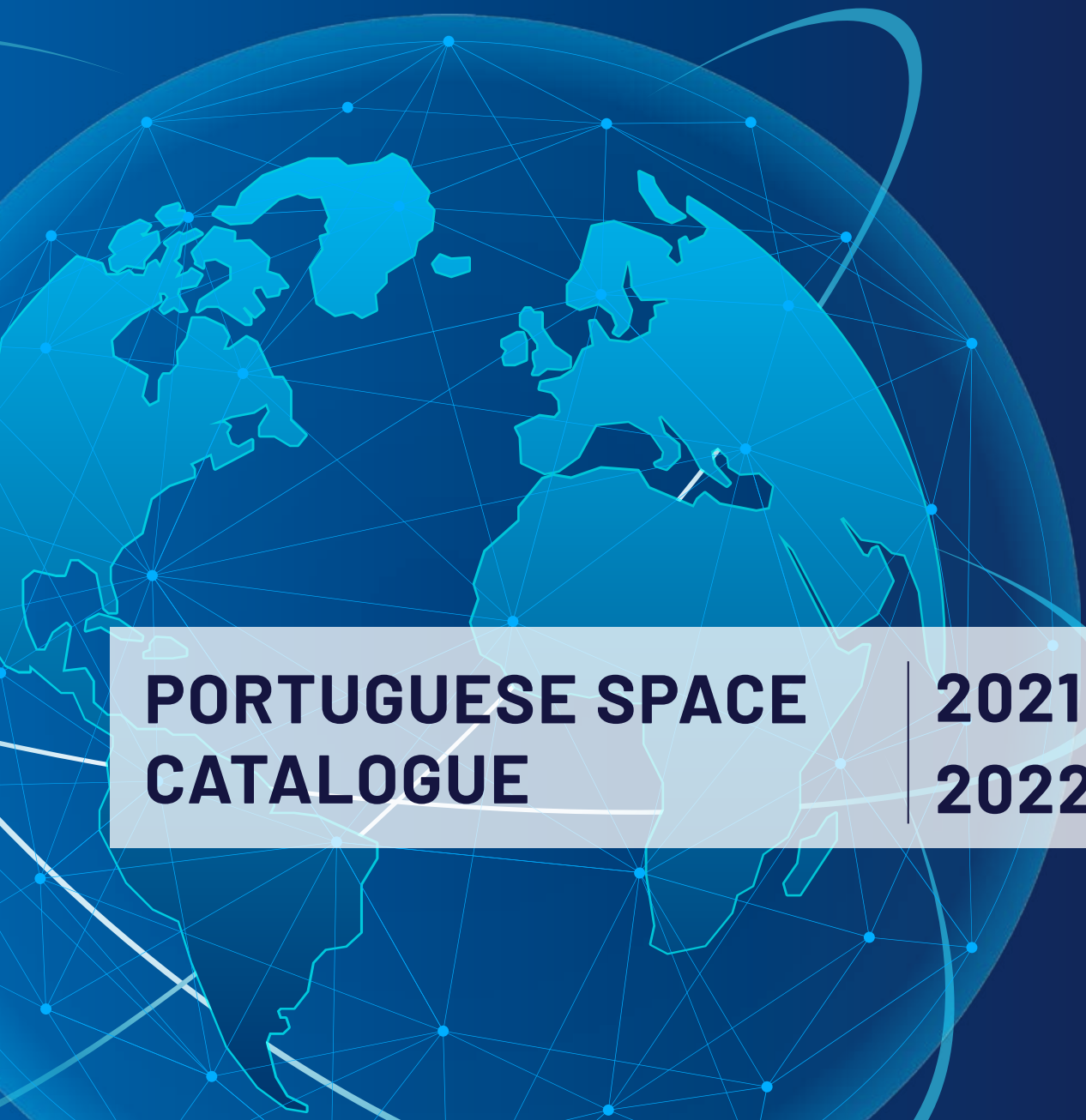
PORTUGAL SPACE

OVERVIEW OF THE PORTUGUESE
SPACE COMMUNITY



PORTUGUESE SPACE CATALOGUE

2021 – 2022

CONTENTS

The Portuguese satellite operator GEOSAT captured the new branch of lava formed in October during the eruption of the Cumbre Vieja Volcano, in La Palma (Spain). During the eruption GEOSAT collaborated with Radiotelevisión Española and IPMA Instituto Português do Mar e da Atmosfera in tracking changes at the island.

New frontiers for Space in Portugal and Europe — Making citizens an integral part of space developments

Manuel Heitor, Minister for Science, Technology and Higher Education

After 20 years of significant investments in technology development and capacity building in space, Portugal has increased its programmatic and policy ambitions in space systems with great success in recent years. Examples of this process include:

- the definition and promotion since 2016 of an international research and innovation agenda on "Atlantic Interactions", which resulted in the creation of the **"Atlantic International Research Centre - AIR Centre"**, since 2017, as an international network research and innovation organisation to explore and exploit space for the socio-economic development of the Atlantic as a multi-disciplinary and multi-national endeavour, including and **ESA_Lab@Azores** at the island of Terceira in the Azores, focused on earth observation related systems and maritime surveillance;
- the definition and promotion of a *national space strategy* **"Portugal Space 2030"**, since 2018, which is oriented to promote **Portugal as a globally recognised authority in Space-Climate-Ocean interactions with a focus on the Atlantic** and its socio-economic exploitation;
- the creation of the national *Portuguese Space Agency*, **Portugal Space**, since 2018, which has been mandated to implement the national space strategy on behalf of the government and in articulation with a diversified set of funding sources, including ESA and European centralised and decentralised funds, as well as national funds;
- the approval of the first *legal regime of space activities*, **"Portuguese Space Law"**, in 2019;
- the definition of an implementation strategy **"+Space in Portugal and Europe with ESA"**, for the Portuguese participation in the ESA's Ministerial Meeting, in November 2019;
- the articulation of the latter with European centralised and decentralised funds (including H2020, Horizon Europe and structural funds, as managed and articulated in Portugal by AICEP, ANI, COMPETE) and national funds and projects (as managed by FCT and through national and International partnerships in terms of the *Program Go Portugal - Global Science and Technology Partnerships* Portugal, including the MIT-Portugal Program and the Program and the UTAustin Program), since 2018;
- the development and promotion of a **new satellite operator, GEOSAT**, oriented towards high and very high-resolution Earth Observation, in operation since 2021 through a close articulation between the business sector, the AIR centre and the national engineering centre CEiiA;
- the promotion of **space science education for all,** at Ciência Viva Agency and the ESERO network, including the promotion of the **CANSAT student competition** since 2016, as well as the launching of the **EuRoC student competition** since 2020;
- the promotion of the 500K€ "AI Moonshot Challenge", though the Lisbon Web-summit, since 2020;
- **Strengthening space research and innovation** in close articulation with the network of major research labs, **Associate Laboratories and Collaborative Laboratories**, as well as the enlargement of higher education programs in **aerospace engineering**;
- the definition and promotion of the **"Azores International Satellite Launch Program – Azores ISLP"**, with a new phase planned for 2022-2023, oriented towards the installation and operation of a *small and open spaceport* with reutilization of micro launchers in the island of Santa Maria in Azores;
- the promotion of additional **space related infrastructures in the island of Santa Maria**, Azores, including: i) a teleport, including a 3 meters antenna operational since 2009 and a 15 meters antenna, operational since 2020; ii) testing facilities for engines; and iii) additional landing facilities and payload preparation for the future European spacecraft Space Rider.

The public investment level more than double in the last 4 years, from about an overall level of 25 million euros in 2016 to an estimated level above 52 million euros in 2021. In association with this increase, the sources of funding were considerably diversified, mainly by attracting European centralized (i.e., H2020) and decentralized funds (i.e., structural funds, FEDER, ESF) in addition of ESA related procurement.

Portugal is promoting a new satellite operator, GEOSAT, oriented towards high and very high-resolution Earth Observation

In terms of funding, the overall target is to multiply the space sector, by at least, 10 times in the coming decade, with a distribution of 30/30/30 between european/ commercial investment, which sets great challenges by Portugal Space in close articulation with the Portuguese government. This target includes the following main challenges:

- Increase the annual outcome of space related activities in Portugal to around **500 million Euros by 2030**, towards an investment structure of about **60%public and 40% private**;
- Create and promote about **one thousand skilled jobs in Portugal** in the period 2021-2030;
- **Promote new technology-based start-ups**, mainly those focused on **"deep-tech"**, **attract major players to operate in Portugal** and the development of new entrepreneurial projects to help promote new high added-value activities;
- **Strengthen space research and innovation** in close cooperation among academia, scientists, the public administration and, above all, the business sector, together with the development of new skills and the advanced training of qualified human resources.

This set of targets and challenges requires and represent a major collective effort to guarantee the following processes of diversifying and articulating the attraction of funding sources:

1. **Global investment level:** An overall level of national and European, public and private, investment in space related activities of **2500 million euros for 2020-2030**;
2. **Portuguese Recovery Plan, 2021-26:** An overall level of investment of 200 million euros for 2021-2026 in association with a major innovation agenda oriented towards the four great challenges listed below;
3. **European Space Agency - ESA:** An overall level of national investment in ESA of **250 million euros for 2020-2030** (including about 120 million euros in 2020-2025), with the related return in procurement activities to main stakeholders operating in Portugal in close articulation with other national and, above all, European funding sources, in a way to guarantee **a "multiplication factor" of 10 regarding the impact of ESA in the capacity to raise other**

sources of funding for space related activities in Portugal;

4. **Beyond ESA:** the challenge of better using the national investment in ESA to help raise other sources of funding for space related activities in Portugal requires a correct articulation of the national participation in the various ESA programs with Horizon Europe (following the experience with H2020 and the past European framework programs for research and innovation), the European Space program, for 2021-2027, the Digital Europe Program (DEP), for 2021-2027, the European Structural and Investment Funds (ESIF) and, above all, the design and implementation of the program PT2030 (2021-2027; following the experience of the implementation of PT2020, 2014-2020), as well as emerging forms of fund raising and investment in Europe (including the Joint Under-takings, JUs), under development by the European Commission;

5. **National competitive programs for research and advanced training**, as managed through the Portuguese Science and Technology Foundation (FCT);

6. **Business expenditure by private firms,** including foreign firms operating in Portugal and Portuguese firms;

7. **Other sources of funding,** including venture and investment funds.

The milestones and ambitions described above have been discussed internationally in many international fora, including those organized and promoted under the context of the Portuguese **Presidency of the European Council in the first half of 2021**, as well as in the current **co-presidency of the ESA Ministerial Council with France, 2019-2022** and the Portuguese **Presidency of the EUREKA Network, 2021-22**. With this unique alignment, the dedication to completing such great challenges will bear fruits with significant international impact, contributing not only to strengthen Portugal but also Europe on a global scale.
From a policy and market point of view, the great challenges to be tackled are:

1. **Guarantee citizens are an integral part of space systems and developments, by promoting the use and of uptake of space data, information and services**, as well as the development of the **space ecosystem and downstream sectors**, including the development of new space services oriented to non-space sectors (e.g., sustainable land management and register; forest fire prevention; maritime surveillance car mobility and sustainable city traffic management);
2. **fostering the growth of "New Space" activities and approaches,** as well as fostering the growth of demand for space-based data, which requires the update of the free and open Copernicus data policy, in articulation with new satellite constellations towards a system of higher resolution data generation.

The public investment level more than double in the last 4 years, from about € 25M in 2016 to an estimated € 52M in 2021.

The challenge is to better use the national investment in ESA to help raise other sources of funding for space related activities in Portugal.

From a programmatic point of view, the overarching vision is that before the end of 2026 an open multi-purpose integrator and system are established making use of a dedicated low Earth orbit satellite constellation with different types of sensors to provide high resolution Earth observation capabilities. It must combine already existing space and in-situ data sources, stimulating scientific research and business growth, thus contributing to the socio-economic development of "Blue Worlds", including the Atlantic Ocean.

The three GREAT PROGRAMMATIC CHALLENGES to be tackled include:

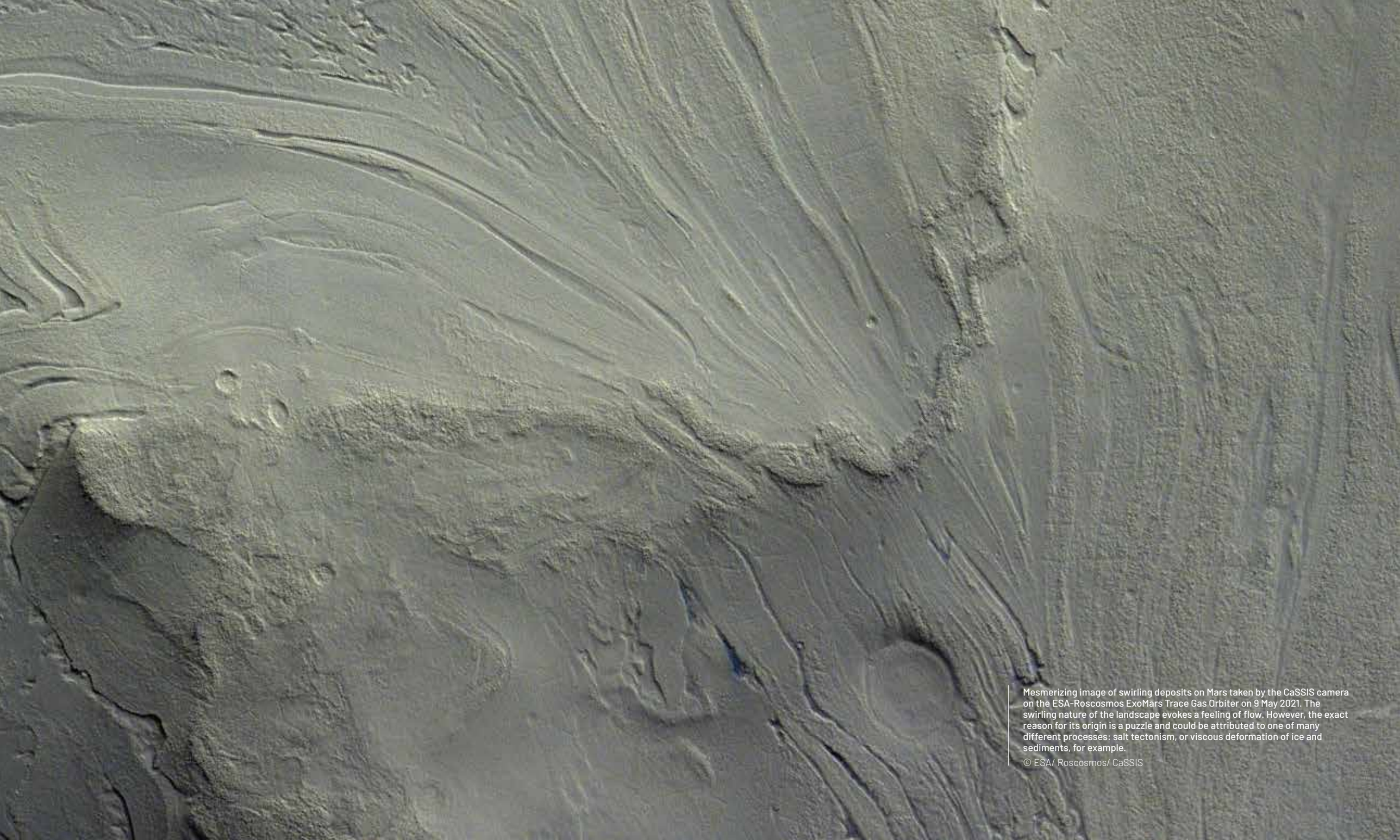
1. GREAT CHALLENGE 1: **establish, maintain, and guarantee the operation of an "Atlantic constellation"** of very high-resolution (i.e. submetric) satellite-based Earth Observation systems, in international cooperation and under the coordination of **GEOSAT**, in articulation with the "Atlantic International Research Center - AIR Center", as well as together with new technology-based firms, including for ***space traffic management***.

2. GREAT CHALLENGE 2: **Build, promote and operate a downstream digital platform, "Digital Planet"**, capable of integrating multiple sources of data, including space, and extracting information by making use of advanced digital technologies, such as AI, to be put at the service of entities (public and private) across the country. It should consider the potential development of a **"Southern-European Space-based System for Sustainable Land and integrated Rural Fire Management"**, as well as a possible "**Atlantic-Baltic-Mediterranean R&I platform for a sustainable Blue economy"**, engaging the Atlantic International Research Centre - AIR Centre;

3. GREAT CHALLENGE 3: the establishment of a **space innovation ecosystem**, specifically in Azores, Santa Maria, including:

   a. **A Teleport** to support ground segment operations and data flow, including the expansion of and existing 15 m antenna; a 3m antenna (ESA) and EUMETSAT facilities;
   b. A potential **landing facility for Space Rider**, the future European transportation vehicle for microgravity experiment (currently being developed by Thales Alenia Space and Avio), together with the necessary **infrastructures for payload preparation and test**;
   c. **Infrastructures for engine testing** for micro launchers;
   d. Potential development of the **Azores International Satellite Launch Program – Phase 2, in terms of launching/landing facility for small launchers** for small-range payloads, focused on the concept of "reutilization of launchers", with a vertical **spaceport**, access to a maritime port for recovery of components and the necessary infrastructures for reutilization of launchers guaranteeing three simultaneous and challenging requirements: i) adequate **payloads**; ii) adequate **launch frequencies**; and iii) internationally competitive cost structure, as measured in terms of the **"cost per kilo in space"** (preferably, below 40k euros/kg).

Overall, our common challenge, but also great opportunity is to guarantee that citizens are an integral part of future space systems and developments.



Mesmerizing image of swirling deposits on Mars taken by the CaSSIS camera on the ESA-Roscosmos ExoMars Trace Gas Orbiter on 9 May 2021. The swirling nature of the landscape evokes a feeling of flow. However, the exact reason for its origin is a puzzle and could be attributed to one of many different processes: salt tectonism, or viscous deformation of ice and sediments, for example.

The Portuguese Space Community

Ricardo Conde,
President of the Portuguese Space Agency - Portugal Space

New technologies, new services and new markets are emerging and converging for a real change.

This generation will be the one that will fully migrate to the digital world and also the first to witness the departure from our planet to live in other worlds in a more permanent base.
We have the expectation of making space an extension of our existence and a starting point for our extension beyond the Earth, maintaining this human characteristic that we have as natural explorers.
The benefits of Space technologies are now unquestionable in an increasingly technological and interconnected society. Services such as satellite navigation, communications and earth observation are structuring and vital to the services used daily in our society. But space will also be in this decade source for other economic developments in, until now, technological sectors that didn't use space such as pharmaceutical industry, new materials, medicine, and others.
But there is also an enormous concern in these dimensions of the future: to take care of our planet and ensure sustainability in a new relationship with it!

The impact caused by men on our planet in the last 50 years is greater than the impact caused throughout the history of human evolution.
The potential for devastation because of environmental degradation caused by man as well as the consequent and worrying climate change must be in the concern and action of Governments.
Knowing the dynamics of climate-oceans-atmosphere-territory interactions, is crucial to adapt economic development models to policies that lead to a sustainable model and balance with nature. The new capabilities of earth observation through satellites with new sensors are increasingly necessary, in order to obtain more and better data, to generate more information, contributing to a better knowledge of the dynamics of our planet in its interaction with us.
Therefore, it is important to preserve the continuity of these services, envisioning them in a technological evolution and ensuring the sustainability of the use of space, as a common good that must be taken care of and preserved, for the benefit of people.
Access to space is more and more accessible and the shift to the New Space paradigm, by providing new services through mega-constellations with thousands of satellites, from new private actors, puts at risk the sustainability of outer space, increasing the risk of collisions generating space debris, creating exponentially more debris.
This poses a high risk to continue using the outer space as a place of use for the benefit of people.
Hence, there is a global scale articulation urgency for the regulation of the outer space usage, representing also a technological challenge for the development of new technologies to address the Space Situational Awareness (SSA), with active systems for the removal of space debris, new technologies to monitor space debris (from Earth and in orbit), using sensors embedded in satellites using AI for Automatic Collision Avoidance, create dynamic catalogues and also, de-orbiting systems and technics.
These are the key areas that the Portuguese Space Agency intends to position the country in the use of space technologies for this decade, aligned with the ESA Agenda 2025 and the three priority streams (Accelerators) as an answer for urgent societal challenges, to innovate and implement space-based solutions for societal benefits, in a sustainable way: **A Sustainable Space for a Sustainable Earth**
Investing in new sensors for earth observation, which allow us to act in the knowledge of territory management, in its various aspects, such as fire prevention, dynamic land registration, water resources management, precision agriculture, coastal erosion, as well as monitoring the Atlantic in its resources and activities.
Creating an industrialization agenda for the Space sector, with the capacity to develop and integrate systems in Portugal and to position Portugal as a one of the countries with the capacity to develop downstream applications.
Invest in the development of new tools for Space Situational Awareness (SSA) contributing to the sustainability of outer Space and in strengthening national capacities, in the sense of national contribution to the development of the future space traffic system in Europe.

Increase our national participation in scientific missions

that will allow our scientists and academics from different fields to participate in renowned international collaborations such as SKA, EST, ESO and ESA scientific missions.

Support the development of skills and competences in our companies and create innovative programmes for training and motivate our young generation for space sciences and STEMs.
This catalogue, with its main actors, represents the Portuguese spatial ecosystem, where all its aspects, industrial, teaching and research, training, industrial policy, law, entrepreneurship, educational promotion are represented.
Naturally, the Portuguese Space Agency's ambition is to make this ecosystem grow and

make Portugal, by 2030, a Space Nation!

Commercial Space Age, the next Portuguese frontier

Luís Castro Henriques,
Chairman & CEO of AICEP - Portuguese Trade & Investment Agency

Today Portugal is widely recognized as a competitive, innovative, and attractive destination for business and investment, throughout different economic sectors. In recent years, Portugal has showcased to the world its capabilities not only in the areas of Industry, Trade and Tourism, but also in the Services Industry, with increasing exports in volume and value and attracting systematically further high added value investment.

Portugal has a highly skilled talent pool, a multilingual and multicultural working environment, and a very low operational risk, ranking 4th in Global Peace Index 2021 and 7th in Political Stability (World Bank). Also, Portugal has the 3rd highest rate of Engineering graduates in the EU and ranks 7th in English Proficiency. The strategic location make Portugal a gateway for Europe and, due to its historical and cultural link to Portuguese speaking countries, also to Africa, America, and Asia.

AICEP, as the Portuguese Trade & Investment Agency, provides support for investors looking for a new location or seeking to expand operations, working as a one-stop-shop in all phases of the investment.

Space is the next frontier. Space is no longer something of scientific fiction but a new frontier of opportunities to be taken. And Portugal and the Portuguese people are no strangers to overcome the new frontiers placed before them.

Today, Portugal Space is part of some of the most challenging European Space programmes, covering key domains of space applications, ranging from satellite telecommunications, global navigation systems, Earth observation, space technology, space sciences and robotic exploration. This is the beginning of the Commercial Space Age for Portugal.

We are happy that investors are choosing Portugal for the establishment of Innovative projects in this industry. Newcomers such as RFA, which chose Portugal to develop composite structures of its launch vehicle RFA ONE together with Portuguese CEiiA is a clear example to the Industry of the Portuguese engineering capacity to be part of demanding and innovative Space projects.

Companies like Deimos, with its space engineering development centre, or Edisoft, a key partner in the development of European Satellite Navigation and Communication Systems, have been helping Portuguese companies to conquer its place on this industry.

The Azores islands, namely Santa Maria, provide a unique opportunity for the rocket launchers industry, due to the unbeatable location. The recent announcement by LeoLabs to invest in the Spaceport as a site for its next Space Radar for Low Earth Orbit operations is very important.

The Portuguese Academia knows the potential of the sector. The University of Aveiro started a new degree in Aerospace Engineering, an answer to the increasing demand of skilled engineers that will complement Porto and Lisbon degrees. This is enhanced by a network of R&D centres researching and developing new solutions, such as INFANTE Space Mission.

Space launchers components, a spaceport, satellite production and management, software development, data collection, new materials research, space tourism, are all areas where Portugal can make a significant contribution for the Space Industry. This is where the frontier will be taken and where Portuguese companies can deliver the goods and services the industry is looking for.

We are aware of the challenges that lay ahead, but we believe Portugal and its talented people have unique capabilities and speed to overcome them. Portugal is the right choice for innovative and challenging projects in the aerospace sector!

FCT, From the Space Office to Portugal Space

Helena Pereira, President, Portuguese National Funding Agency for Science, Research and Technology

The Portuguese Space Catalogue is a window to show the best space related science and technology projects and products made in Portugal. It is therefore an important witness to the remarkable evolution of the space sector in Portugal during the past twenty years, in parallel with the overall strengthening of the scientific and technological landscape and the increase in all research and innovation indicators of the country.

Portugal became a member state of the European Space Agency by the end of 2000, which was key to shape the national space community along with the full participation in ESA scientific, technology and applications programmes.

Fundação para a Ciência e a Tecnologia (FCT), as the national public agency promoting and funding science, has been supporting the Portuguese Space community and its participation in the European Space Agency (ESA), as well as in other international space related organizations such as the Square Kilometer Array Organization (SKAO) and the European Southern Observatory (ESO). FCT is one of the founding agencies of the Portuguese Space Agency that was built upon the work of a dedicated Space Office within FCT.

FCT has witnessed from a privileged standpoint the growing and scope enlargement of the sector and has had a pivotal role in encouraging the participation of Portuguese companies and research institutes in space activities and space missions. FCT was responsible for the three previous versions of the Portuguese Space Catalogue, which registered the growth of the space community, the increase in technological complexity and the impact of scientific achievements. This is an inspiring proof of the progress Portugal has achieved in this domain.

FCT has also supported, and keeps supporting, advanced training of engineers in ESA, ESO and NASA, and promoted the first space technology transfer initiative in Portugal and ESA business incubation centre, which today is reaching our best entrepreneurs and spreads throughout the country (ESA Space solutions Portugal).

The role played by FCT over the years in space, including the representation of Portugal in ESA, ESO and SKAO, the promotion of the research and innovation thematic agenda for Space and Earth Observation, has enabled its key contribution shaping the Portuguese Space Strategy 2030, approved in 2018, and led to the creation of the Portuguese Space Agency, in 2019, taking over and leveraging FCT Space responsibilities at the time.

Today FCT is a proud shareholder and supporter of Portugal Space, providing relevant resources, which pushed the space sector to a new level of capabilities and potential over the past two years. This new edition of the Portuguese Space Catalogue is a mirror to it.

The space community, both scientific and business-oriented, which developed over the years, leverages today our best research, innovation and growth, in a multidisciplinary context in areas ranging from astrophysics, astronomy, artificial intelligence, big data, Earth observation, launchers technology, among many other disciplines.

I hope that this new catalogue once again inspires the new generations for further and disruptive endeavours, planting the seeds for the next catalogue. FCT surely will pursue as a strongly committed partner.

Innovation in Space, from Portugal to the World

Joana Mendonça, President, National Innovation Agency (ANI)

This is probably the most interesting time in the history of the Portuguese Space sector, and this Catalogue is an expression of it. The current catalogue presents an overview of the sector, describing its main stakeholders, including companies and research institutions, and it is a valuable tool to understand and get to know the sector.

The sector's dynamism has been evident in the ability to develop new projects, which led to the capture of around 40M€ in the Horizon 2020 program from almost 140 participations in the space area, integrating different stakeholders, including companies to research centers and higher education institutions. Although the global European budget for space has decreased, the Portuguese sector has increased participation at a steady annual rate in funding and participation of approximately 2% a year. In addition, there has been a growing number of projects in other areas such as climate action, based on Earth observation, with a relevant use of space data and related applications. This growth in the sector is also visible in the Portuguese support mechanisms for innovation, where the number of space related projects doubled from the period 2007-2014 to 2014-2020, capturing 10 times more funding.

This activity includes a wide range of innovation activity and teams, including projects in topics as diverse as systems and equipment, materials, security, climate action and human factors, and building knowledge for further projects and activities.

From an innovation point of view, the space sector brings together highly specialized knowledge and economic activity, generating value for the society, while contributing to address the biggest challenges of the world. This catalogue presents a snapshot of the value from Portugal to the world.

Space Security

Gameiro Marques, Director-general, National Security Office (GNS)

The involvement of GNS in space security related matters was both natural and mandatory, considering its overarching responsibility for all national security matters, including the activities related to space, and its role as Competent PRS Authority (CPA).

For the prosecution of its task, GNS actively participates in all national and European space security forums, helping to define and implement the security frameworks of the space programmes developed by the EC.

On its role as CPA, GNS is responsible for ensuring the fulfillment of the security requirements of the service and manage the access rights within the national user's community.

Recently, GNS was also designated as GOVSATCOM Competent Authority for Portugal, in a role with similar responsibilities as per CPA.

GNS is also actively involved in the EC/EUSPA research programmes, as an enabler for the Portuguese industry and academy participation in those programmes, and on the Space Surveillance and Tracking (SST) consortium, contributing for the security committee of the programmes.

In the near future it is expected that GNS will have to boost its space related operational capacity, considering the entry into service of PRS and GOVSATCOM and the need for timely response to the requirements of the users.

To address this need, GNS has already taken firm steps to start the adaptation of its internal capabilities, both in human resources and in infrastructure, to be able to perform its task's timely and efficiently.

The National Space Authority

João Cadete de Matos, Chairman, ANACOM

The powers and responsibilities of the National Space Authority were entrusted to ANACOM, by Decree-Law no. 16/2019 of 22 January. This piece of legislation sets out an innovative legal framework designed to facilitate the development of space activities, products and services in Portugal, attracting companies and added-value, knowledge-based operations, and stimulating research and development in this area.

The Space Authority mission, as complemented by Regulation no. 697/2019, of 5 September, is to regulate, supervise and oversee space activities, including: maintaining safety/security of space activities; issuing certificates of prior qualification, grant licenses and register space objects; cooperating with other national and international authorities in the space sector; issuing regulations and instructions on practices to be followed by market players; overseeing and enforcing compliance with the legal obligations; instigating and instructing breach proceedings and applying sanctions; assessing and deciding on any requests or complaints from the undertakings, and resolving any disputes between them.

ANACOM is committed to support the development of the Portuguese space ecosystem and is getting ready to grant the first licenses, as soon as expressions of interest are received from operators. To that end, further legal procedures are under development, the national space portal is being set up and skills and capacity building are being promoted. ANACOM is also the funding contributor to the Portuguese subscription of ESA Telecommunications Programs, under which are running several key initiatives for the development of the national space ecosystem, such as ESA BIC PT and Spark4Business.

IPMA

Portuguese Institute for Sea and Atmosphere

Isabel F. Trigo, Coordinator of IPMA's Earth Observation Unit

Earth Observation (EO) satellites have consolidated their role in numerical weather prediction and are becoming increasingly relevant for climate monitoring. The growing EO data records allow assessing variability and trends of the various components of the Climate System and constitute a sustained source of information for our understanding and modelling of its complex bio-geophysical processes.

IPMA - Portuguese Institute for Sea and Atmosphere has been exploring satellite observations to monitor land surfaces and their interactions with the atmosphere for over two decades. During this time, IPMA has combined research and operations, becoming internationally recognized as a leading centre in the field. The products developed by IPMA have benefited weather forecasts and contribute to diverse climate and environmental services, such as, amongst many others: to identify fire hot-spots and quantify fire risk and emissions; to assess the intensity of heat waves or cold spells; to evaluate vegetation growth and water stress.

The Sentinel missions and the next generation of EUMETSAT satellites will significantly increase the amount and quality of EO data. IPMA has embraced the challenge of fully exploring such observations, reinforcing its contribution to EUMETSAT Satellite Application Facilities, to Copernicus services, and to ESA Climate initiatives. Ensuring consistency of multi-mission satellite products will be our top priority, as only this will allow the insightfully monitoring of a changing Planet.

SMOS

Earth Observation and Artificial Intelligence to monitor the territory

Mário Caetano, Deputy Director-General, Directorate-General for the Territory (DGT)

Significant developments in the space industry and science have prompted acquisition, distribution, processing, and analysis of Earth observation data at large scale in recent years. Countries are increasingly in a position of improving the quality and offer of space-based products as a response to the ever growing need for information by the society.

Portugal started to develop a land cover monitoring system (SMOS - Sistema de Monitorização da Ocupação do Solo) to provide new cartographic products on land cover with high spatial resolution and frequent updating to support applications on forest, agriculture, water resources, spatial planning, and so forth. SMOS is an initiative of the Directorate-General for the Territory (DGT) and has been developed in house by a research team with competences acquired in national and international funded projects.

SMOS is already releasing since 2020 a new land cover map produced annually based on Sentinel time series and artificial intelligence. Uptake of the maps has increased, including by the public administration in the management and preventions of wildfires. Monthly maps are under development to increase monitoring of frequent events on forest, such as wildfires and clear-cuts. DGT is also coordinating the first airborne LiDAR data acquisition for the country and involved in a project to explore space borne LiDAR to monitor biomass.

AED

Bringing the future for Space

José Neves, President of AED Cluster Portugal

AED Cluster Portugal is the Portuguese Cluster for the Aeronautics, Space and Defence Industries. Involving more than 100 entities established in Portugal, the Cluster gathers the main stakeholders from the three sectors and has a clear vision to make Portugal an international reference for added-value, competitiveness and sustainability within these industries.

The space sector has been increasingly recognized as a relevant economic, technological, geostrategic, and human capital qualification driver, transversally present in our daily life, supporting a diversified range of activities.

Portugal is at a unique moment in its history, of convergence of endogenous and external contexts that may enable an incomparable leap in this value chain, previously hardly imaginable.

On the one hand, the capitalization of human resources and infrastructures resulting from the participation in ESA since 2000, the creation of the Portuguese Space Agency and a Space 2030 strategy, and the leveraging of several initiatives already underway, such as the Azores SpacePort and in particular the development, manufacturing, and operation of a microsatellite constellation.

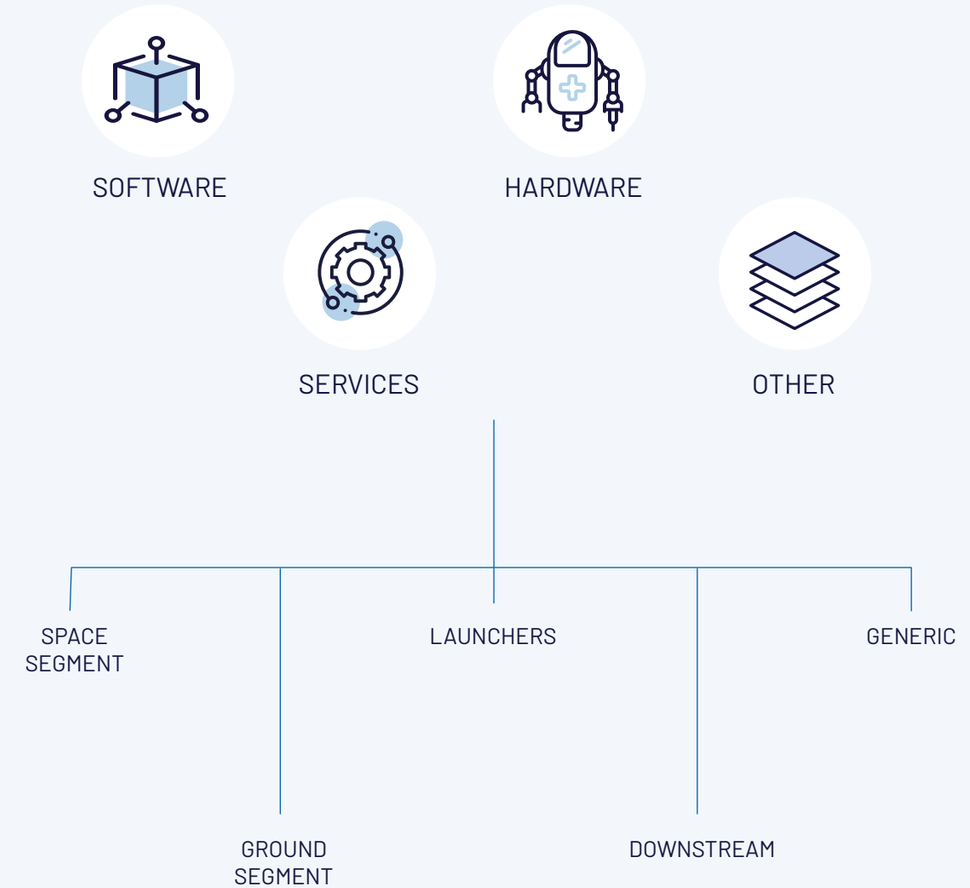
On the other hand, the emergence of a totally new dynamic in the global Space sector, with a growing race for access and use of Space, based on new business models, more accessible technologies, new geographical players, and an exponential widening of the range of satellite information applications to tackle various societal challenges.

It is in this context, frankly positive, that we must explore the intersections and synergies along this value chain, articulating all actors of the ecosystem, both national and international, to con solidate our position on these high value-added and export supply chains and ensuring a position at the forefront of the New Space.

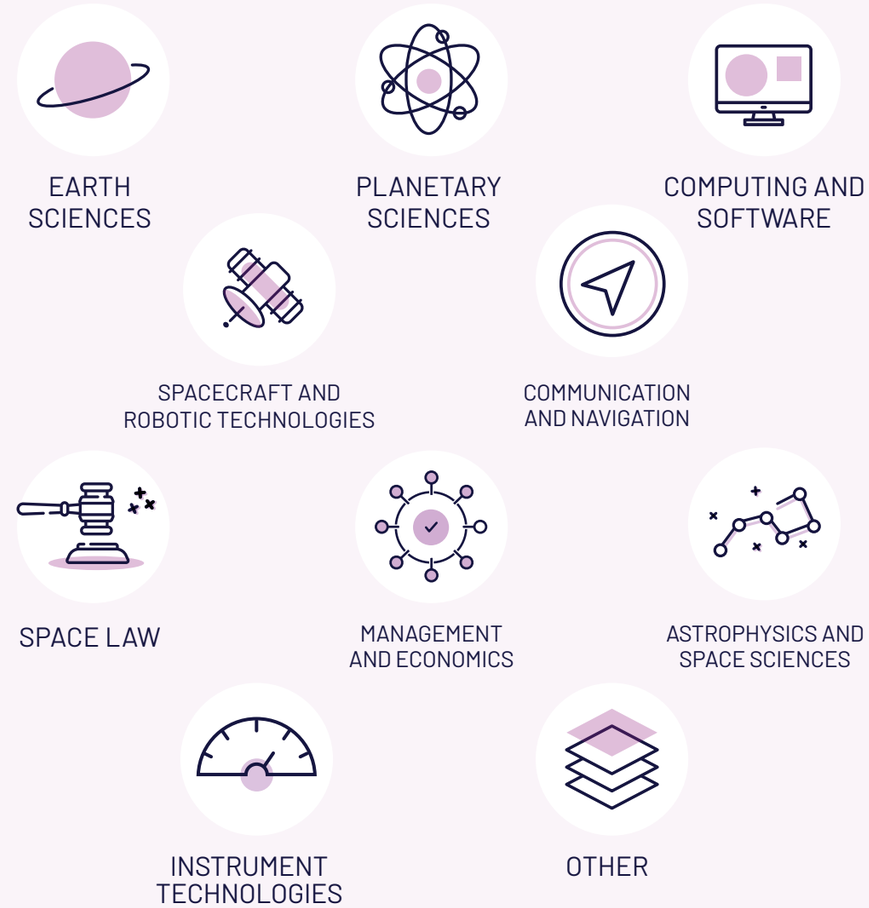
INDUSTRY

PAGE 32 – 149

OVERVIEW OF ALL INDUSTRY SEGMENTS



OVERVIEW OF ALL RESEARCH SEGMENTS



INDEX INDUSTRY COMPANIES

A. Silva Matos Metalomecânica

Beyond Steel.

A. Silva Matos Metalomecânica is a manufacturer of pressure equipment for industrial storage and processing applications, mainly from carbon steel and stainless steel. Regular supplier for special projects within scientific applications, deep sea technologies, space applications [mechanical ground operations].

PRODUCTS/ SERVICES

Design and production of pressure vessels, chemical reactors, heat exchangers, stainless steel vessels and metallic structures.

[1] **Euclid SSH MGS**
Manufacture and supply of Transport Container, Integration & Handling device and Lifting device.

[2] **ALMA Observatory (ESA)**
Manufacturing of LPG reservoirs for the power generation plant at the Atacama desert.

CERTIFICATION/ S:

►ISO 9001:2015 ►ISO 14001:2015 ►OHSAS 18001:2018
►ISO 3834

INDUSTRY

TECHNOLOGY DOMAIN

- Software
- Hardware
- ✓ Services
- Other

SEGMENT

- Space Segment
- Ground Segment
- Launchers
- Downstream
- ✓ Generic

SUB DOMAIN

› Other: Manufacturing of Ground Equipment

NON-SPACE SECTORS OF ACTIVITY

› Manufacturing
› Structures

[1+2+3] Transport container, handling and lifting device for Euclid satellite

EST. 1980 | Sever do Vouga, Aveiro [PT] | Cláudia Pinheiro [CEO]

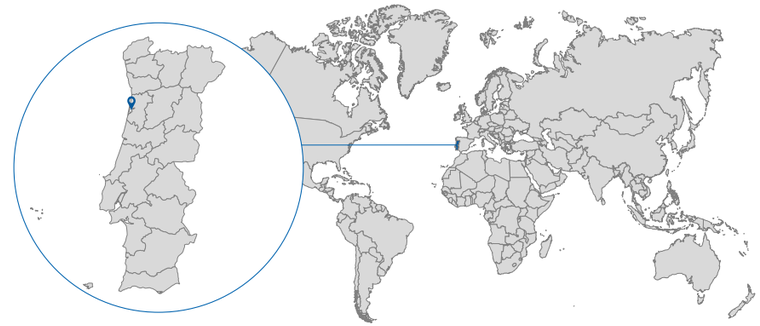
an ASMMETAL Company

CONTACT

E asm-metal@asilvamatos.pt
W www.asmmetal.pt
T +351 234 590 200

Pedro Pinheiro [Commercial Manager]
pedro.pinheiro@asilvamatos.pt

WORLD PRESENCE
Sever do Vouga [PT]



INDUSTRY

TECHNOLOGY DOMAIN

- Software
- ✓ Hardware
- Services
- Other

SEGMENT

- ✓ Space Segment
- Ground Segment
- Launchers
- Downstream
- Generic

SUB DOMAIN

- › Mechanisms
- › Structures
- › Other: Power and GSE (Mech & Elect)

NON-SPACE SECTORS OF ACTIVITY

- › Big Science/LRF (ITER)
- › AGVs
- › Aerogels

Active Space Technologies

Making Space a Global Endeavour.

Active Space Technologies is a European based company operating in space, aeronautics, nuclear and industry. We offer bespoke electro-mechanical systems for extreme harsh environments. Our systems are qualified for high-g, high temperature and radiation environments. Active Space Technologies core activities focus on space instrumentation, structural and thermal control systems for space applications, severe environment monitoring and control systems for aerospace applications, remote handling systems for hazardous and radiation environments, and automated systems for industry.

PRODUCTS/ SERVICES

[1] **Engineering**
Mechanics: Design of mechanisms, structures, STMs and MGSE (CAD, FEM, Thermal); Electronics: Design of electronics (analogue, digital and mixed signal, reconfigurable hardware (FPGA)), PCB layout, EGSE and harnesses.

[2] **MAIT**
Machining (Al, Ti, special alloys), surface treatments, 3D printing
Assembly & Integration: Cleanroom, Greyroom, ultrasound and plasma cleaning.

[3] **Testing**
TVAC, Vibration (random, sine, shock), Cleanroom, Dimensional control (CMM), NDI.

Track Record: PLATO, JUICE, SolO, BepiColombo, ARIEL, NEOSAT, BIOMASS
Upcoming: HPCM (CIMR/CHIME/LSTM), LAGRANGE, AWS

CERTIFICATION/ S:

►AS9100 ►ISO9001 ►Crimping ECSS-Q-ST-70-26
►Soldering ECSS-Q-ST-70-08 ►SMD ECSS-Q-ST-70-38

[1] PCDU [Power Conditioning and Distribution Unit for Mars Rover]
[2] MSASI [Mercury's sodium atmosphere spectral imager for BepiColombo's MMO]
[3] DSP [Processor Board for Science and Robotic Exploration]

EST. 2004 Coimbra [PT] Ricardo Machado [CEO]

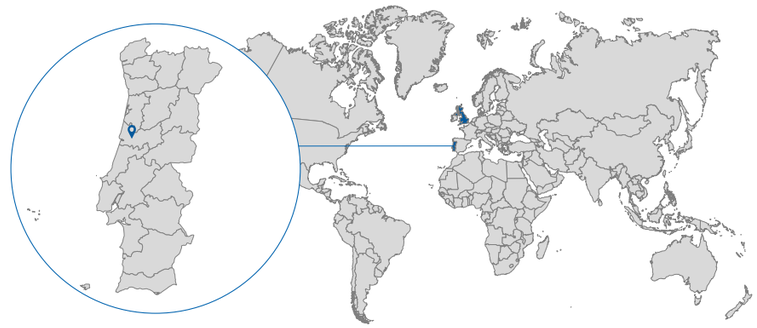
activespace technologies
making space a global endeavour

CONTACT

E info@activespacetech.com
W www.activespacetech.com
T +351 304 505 505

Filipe Castanheira [Business Devt. Manager]
filipe.castanheira@activespacetech.com

WORLD PRESENCE
Coimbra [PT];
London [UK]



INDUSTRY

TECHNOLOGY DOMAIN

- Software
- Hardware
- ✓ Services
- Other

SEGMENT

- Space Segment
- Ground Segment
- Launchers
- Downstream
- ✓ Generic

SUB DOMAIN

- › Materials and Processes
- › Services
- › Other: Products for Machining Hard Materials

NON-SPACE SECTORS OF ACTIVITY

- › Automotive
- › Aeronautics
- › Optics

Afipre – Ferramentas de corte

We are a High Precision technology company that intends to be within the most demanding markets. Knowing that Space is the future, Afipre wants to be part of it.

Afipre - Ferramentas de Corte, Lda. is a manufacturer that develops and produces special high precision cutting tools for the metalworking industry, offering its customers a wide range of customizable and innovative solutions. A company that has more than 20 years of experience, is now putting all the knowledge and investment on the latest technology to manufacture the best products possible.

PRODUCTS/ SERVICES

Afipre produces a wide range of tools in the most varied types of materials such as HSS, Carbide and PCD and wants to become a full line supplier. We make an extensive variety of products such as milling cutters, drills, punches, discs, males or mandrels, combined tools in **PCD, Carbide or Steel with mechanical screw or welded**. Afipre makes service of **Project solutions, Resharpening and Repair tools**.

CERTIFICATION/ S:

▶ISO 9001 ▶IQNET MANAGEMENT SYSTEM

[1] Insert Cutting tool
[2] Carbide and PCD Cutting tools
[3] Discs

EST. 1988 Vila Nova de Famalicão [PT] Aurélio Pinto [CEO]

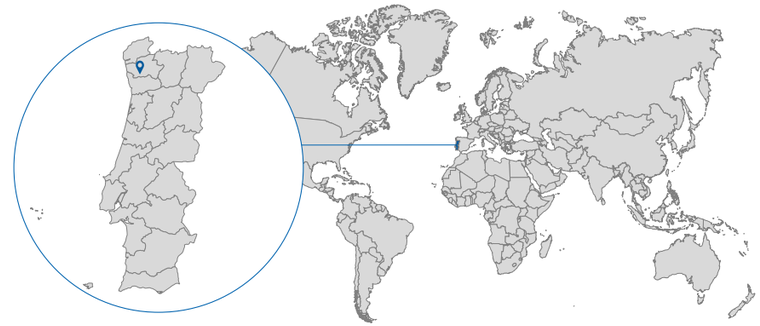
afipre FERRAMENTAS DE CORTE

CONTACT

E afipre@afipre.pt
W www.afipre.pt
T +351 252 493 531

Daniel Pinto [Purchasing & Sales Manager]
daniel.pinto@afipre.pt

WORLD PRESENCE
Vila Nova de Famalicão [PT]



INDUSTRY

TECHNOLOGY DOMAIN

- Software
- Hardware
- ✓ Services
- Other

SEGMENT

- Space Segment
- Ground Segment
- Launchers
- ✓ Downstream
- Generic

SUB DOMAIN

- › Life & Physical Sciences
- › Services

NON-SPACE SECTORS OF ACTIVITY

- › Agriculture
- › Environment
- › Sensors

Agroinsider

Making visible the invisible.

Remote sensors to monitor and inspect agriculture parcels or other type of observation units. Improve agronomic activity and promote environmental efficiency.

PRODUCTS/ SERVICES

[1] **Farm to Fork Compliance Service** [TRL 8]
Using Earth Observation data and proprietary algorithms Agroinsider can provide crop/parcel audits to detect anomalies and provide specialized reports on how to improve fertilizers and pesticides efficiency towards the European FARM TO FORK compliance.

[2] **Green Deal Compliance Service** [TRL 7]
Using Earth Observation data and proprietary algorithms Agroinsider can provide at different scales (parcel, farm, etc...) agroforest CO2 audits, delivering CO2 budgets, CO2 farm design improvements,
CO2 mitigation projects, CO2 trading and CO2 monitoring and validation towards climate neutrality and climate certification considering European Green Deal compliance.

[3] **Biodiversity Service** [TRL 6]
Using Earth Observation data and proprietary algorithms Agroinsider can provide at different scales (farm, regional, etc.) landscape diversity analysis in space and time, delivering specialized reports on landscape diversity design and scouting towards the European CAP landscape diversity objectives.

[1] Agriculture climate footprint calculations taking into consideration remote sensors
[2] Artificial intelligent algorithms report agronomic anomalies for fast and better decisions
[3] Sharing the responsibility with the user in taking decisions

EST. 2015 Évora [PT] José Rafael Marques da Silva [CEO]

AGROINSIDER
Field, Innovation & Science

CONTACT

E info@agroinsider.com
W www.agroinsider.com
T +351 962 858 425
+351 927 506 135

José Rafael Marques da Silva [CEO]
rafael@agroinsider.com

WORLD PRESENCE
Évora [PT];
El Salvador; Nicaragua; Guatemala;
Uberlândia [BR]

INDUSTRY

TECHNOLOGY DOMAIN

- Software
- Hardware
- Services
- ✓ Other

SEGMENT

- ✓ Space Segment
- ✓ Ground Segment
- Launchers
- Downstream
- Generic

SUB DOMAIN

- › Thermal
- › Materials and Processes

NON-SPACE SECTORS OF ACTIVITY

- › Construction
- › Automotive
- › Power Industry
- › Panels and Composites

Amorim Cork Composites

> **Cork. Don´t leave earth without it!**
>
> — Donald Thomas, NASA Astronaut

Amorim Cork Composites researches, develops and manufactures sustainable and high-performance cork composite solutions for several applications in multiple industries such as aerospace, panels and composites, automotive, seals and gaskets, power industry, construction, sports surfaces, flooring, consumer goods, furnishing, footwear. Our industry raw material is 100% natural, which allows us to promote a circular, sustainable economy at all stages of the industrial process.

PRODUCTS/ SERVICES

Amorim Cork - Thermal ablative materials [P50 & P45]:
Our Aerospace grade materials constituents and structure make them ideal thermal protection materials with excellent ablation and insulating properties, maintaining a low weight to low thermal conductivity performance, creating a sturdy char layer that protects the inner material, maintaining its integrity and slowing thermal degradation.

Our products are applied in SRB [solid rocket boosters] engine skirting, nose cone, frustum, forward and aft skirt, external tank attach ring covers, assembly and tunnel covers and range safety system crossover covers.

Space Missions:

- ▶ Intermediate Experimental Vehicle [IXV]
- ▶ Vulcan [ULA launch rockets - NGLS]
- ▶ Atlas and Delta Launchers [ULA]
- ▶ Scout - Mercury Spacecraft - Gemini Spacecraft - Saturn V - Apollo - Ariane 1 - Viking Landers - Ariane 2 - Ariane 3 - Titan III - Space Shuttle - Ariane 4 - Titan IV - Pegasus XL - Mars Rovers - Delta IV - Beagle - Pegasus XL - Ariane 5 - Atlas III-A - Atlas V - Vega - Falcon 9 - IXV

[1] Thermal Protection System - Nose
[2] Mars Mission
[3] Thermal Protection System - Nose II

EST. 1878 | Mozelos - Santa Maria da Feira | João Pedro Azevedo [CEO]

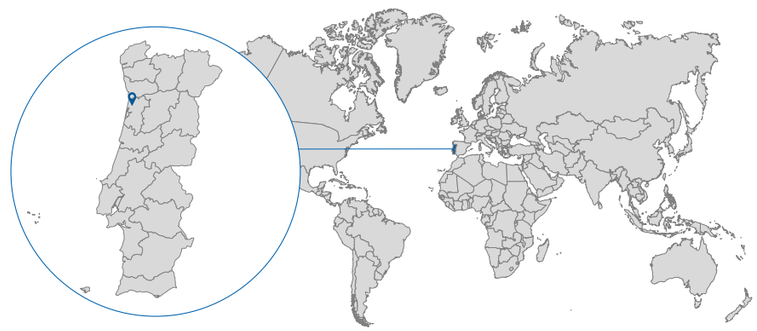
AMORIM CORK COMPOSITES

CONTACT

E margarida.figueiredo@amorim.com
W www.amorimcorkcomposites.com
T +351 227 475 300

Carlos Duarte [Business Developer]
carlos.duarte@amorim.com

WORLD PRESENCE
Santa Maria da Feira [PT];
USA; Asia; Europe



Amorim Cork Composites has been supplying Portuguese cork for space applications for more than 50 years. From the initial Scout rockets, through the Space Shuttle but also including the most modern launchers such as Falcon 9, Ariane 5 or Vega and the upcoming Space Rider, this lightweight thermal protection material has been fundamental to protect rocket engines, fuselage or to manufacture the heat shield of many iconic rockets and space crafts.

INDUSTRY

TECHNOLOGY DOMAIN

- Software
- Hardware
- ✓ Services
- Other

SEGMENT

- Space Segment
- Ground Segment
- Launchers
- Downstream
- ✓ Generic

SUB DOMAIN

- › Structures
- › Materials and Processes
- › Services: Laser, Bending and Machining of Parts

NON-SPACE SECTORS OF ACTIVITY

- › Medical Devices
- › Aeronautics
- › Energy
- › Railway

Argo Baum Tech Precision

Quest for Perfection... putting the utmost care into every product we make.

Argo Baum is a Portuguese private manufacturing company, providing a wide range of the best machining technologies available to produce parts requiring extreme precision and quality, with the most well-engineered and cost-effective solutions. Argo Baum, operating from Portugal, uses the best available technologies in CNC precision machining, helping clients to develop their projects from concept to prototyping and through production to accomplished products.

PRODUCTS/ SERVICES

[1] **Swiss Machining, CNC High Speed Multi-Axis Milling**
Argo Baum provides CNC Swiss machining assuring precision and efficiency to production operations. Multiple tooling sets can conduct operations simultaneously or in rapid succession as the workpiece spins on a rotating lathe. A moveable headstock sets a Swiss machine apart from a conventional CNC turning machine or lathe, being ideal for complex projects with tight tolerances.

[2] **CNC Turning/ Milling**
Argo Baum provides CNC precision machining services with the equipment and expertise required for complex machined components made of different metals and other materials like polymers.

[3] **Laser Cutting, Bending and Assembly**
Argo Baum provides services of fibre laser assuring high cutting speed for different types of structures, materials and complexities, bending work, as well as metal assembly services through processes, as welding, riveting, binding with adhesives and threaded fasteners.

CERTIFICATION/ S:

▶ISO 9001:2015 ▶ISO 13485:2016
▶CE Marking (Prosthetic Parts)

[1] Fibre laser cutting
[2] CNC Swiss machining
[3] Earth viewed from space

EST. 1995 Elvas [PT] Fernando Montenegro Martins & Filipe Bruno Gervásio [CEO]

ARGOBAUM TECH PRECISION

CONTACT

E info@argobaum.com
W www.argobaum.com
T +351 210 543 971/
+351 210 543 973

Alexandrino Pequito
[Engineering Department and Production Director]
Alexandrino.pequito@argobaum.com

WORLD PRESENCE
Lisbon, Elvas [PT]

INDUSTRY

TECHNOLOGY DOMAIN

- ✓ Software
- ✓ Hardware
- ✓ Services
- Other

SEGMENT

- ✓ Space Segment
- ✓ Ground Segment
- Launchers
- Downstream
- Generic

SUB DOMAIN

- › System Design & Validation
- › Other: Radio Astronomy, Radio Frequency and Microwaves
- › Other:Monitoring and Control

NON-SPACE SECTORS OF ACTIVITY

- › Industry 4.0
- › Textile industry
- › Automation and control

Atlar Innovation

Creating novel solutions from Earth to Sky.

ATLAR Innovation is a cutting-edge technology company in the provision of design, operation and maintenance of critical systems in different areas of Space, such as Radio Astronomy, High Energy, Industry 4.0 to smart Astrotourism ecosystem solutions. Its products range from devices to advanced data production.

PRODUCTS/ SERVICES

[1] **Sensors monitoring and control** [TRL 7]
Atlar Innovation develops and maintains UX (User Experience) software used across multiple scientific organisations to monitor and control thousands of devices and sensors, and we guarantee that your system is, and will remain, secure, available, resilient and scalable.

[2] **Intelligent data acquisition and processing** [TRL 7]
Atlar Innovation works in the area of hardware/software interfaces with advanced electronics and data production chain management, operation and maintenance, advanced software and data service delivery, including AI/ML software workflows for industrialised service production.

[3] **Critical information systems** [TRL 7]
Atlar Innovation has expertise in encompassing cloud services, DevSecOps, cybersecurity, application administration, agile multi-cloud environment, and ensure robust, industrial-scale operation with high levels of service (high availability) while delivering outstanding performance and keeping costs under control.

CERTIFICATION/ S:

▶SAFe® 5 Practitioner(SP) ▶SAFe® 5 Scrum Master(SM)
▶SAFe® 5 ProductOwner/Product Manager (PO/PM)
▶LFS458: Kubernetes Administration
▶Google UX DesignCertificate ▶ISO 27001 ▶ISO 9001

[1] Advanced and Intelligent platforms for radio astronomy and Space Surveillance
[2] Advanced computing for complex operations and cloud services
[3] Monitoring and Control System Interface

EST. 2021 | Pampilhosa da Serra [PT] | Hélder Ribeiro [CEO]

CONTACT

E info@atlar.pt
W www.atlar.pt
T +351 234 306 449

Miguel Bergano
[Chief Technology Officer]
Domingos Barbosa
[Chief Operations Officer]

WORLD PRESENCE

Pampilhosa da Serra [PT]

INDUSTRY

TECHNOLOGY DOMAIN

- ✓ Software
- ✓ Hardware
- ✓ Services
- Other

SEGMENT

- ✓ Space Segment
- ✓ Ground Segment
- Launchers
- Downstream
- Generic

SUB DOMAIN

- › Automation, Telepresence & Robotics
- › Other: Additive Manufacturing

NON-SPACE SECTORS OF ACTIVITY

- › Industry 4.0
- › Education
- › Biotechnology
- › Circular Economy

BEEVERYCREATIVE

Imprint Change with 3D Printing.

BEEVERYCREATIVE's activity is the development and commercialization of 3D Printing [Additive Manufacturing - AM] technology. The company started by the design of its own commercial portfolio, composed by innovative and multi-awarded 3D Printers. BEEVERYCREATIVE focuses on the design and development of special AM projects on demand, for which it was awarded. Besides the European Space Agency projects described below, we highlight the projects for 3D printing biomaterials (including living cells), hard metals and circular economy.

PRODUCTS/ SERVICES

[1] **Project MELT**
Additive Manufacturing Breadboard to print High Performance Polymers in Microgravity [TRL 4]

[2] **Project IMPERIAL**
Additive Manufacturing Prototype to print High Performance Polymers in Microgravity with unlimited size [TRL 4]

[3] **Project URBAN**
Consultants regarding Additive Manufacturing for the construction and ongoing operations of an inhabited lunar base [TRL 2]

CERTIFICATION/ S:

▶ CE Implementors of I4.0

[1] 1,5 meter long part 3D printed in PEEK
[2] 3D printing in PEEK - non leaking container and more
[3] 3D printing in PEEK - strong tools and pipes

EST. 2011 · Ílhavo [PT] · Aurora Baptista [CEO]

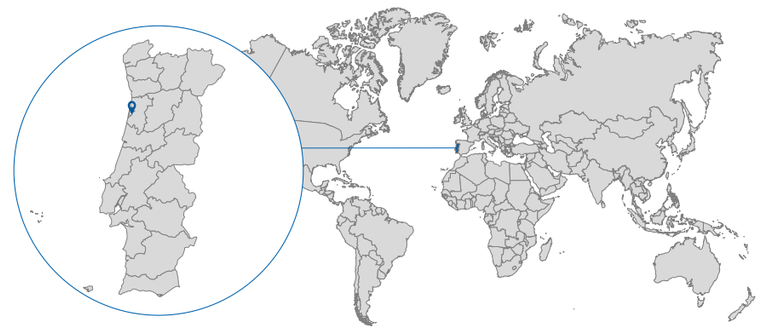
BEEVERYCREATIVE
IMPRINT CHANGE WITH 3D PRINTING

CONTACT

E innovation@beeverycreative.com
W www.beeverycreative.com
T +351 234 198 891

Paulo Casimiro
[Commercial & Marketing Director]
pcasimiro@beeverycreative.com

WORLD PRESENCE
Ílhavo [PT]



INDUSTRY

TECHNOLOGY DOMAIN

- ✓ Software
- ✓ Hardware
- Services
- Other

SEGMENT

- Space Segment
- Ground Segment
- Launchers
- ✓ Downstream
- Generic

SUB DOMAIN

- › Services

NON-SPACE SECTORS OF ACTIVITY

- › Aeronautics
- › Mobility
- › Sports

Bluecover Technologies

Location based technology.

BLUECOVER specialises in geolocation services that provides solutions to aerospace, surveillance and sports businesses based on real-time tracking technology. The company develops its products for the global market and provides consultancy services on IoT, mobile applications and Space technologies, including Galileo, EGNOS and Copernicus.

PRODUCTS/ SERVICES

[1] **GPS Waypoints** is a fast-growing surveying and mapping application for multi-sector professionals that manages points and paths to create thematic maps. This positioning application uses the smartphone's built-in receivers or Bluetooth external receivers. It integrates with our GISUY receivers that use multi-constellation technology for achieving submeter accuracies or multi-frequency RTK technology for cm level accuracies [TRL 9]

[2] **MOB controller** is a mobility sharing and fleet management solution for electric kickscooters. The IoT controller installed on the vehicle allows to locate and remote control the vehicles while the application enables the reservation and usage by the user [TRL 8]

[3] **TRUESHOT Wristband** is a sports auto-tracking wearable specialized for golfing that detects swing movements and extract metrics for training improvement, using motion sensors and a commercial multi-constellation receiver [TRL 8]

[1] Trueshot wristband
[2] GPS waypoints with GISUY GNSS receiver
[3] MOB controller

EST. 2014 | Lisbon [PT] | Nuno Duro Santos [CEO]

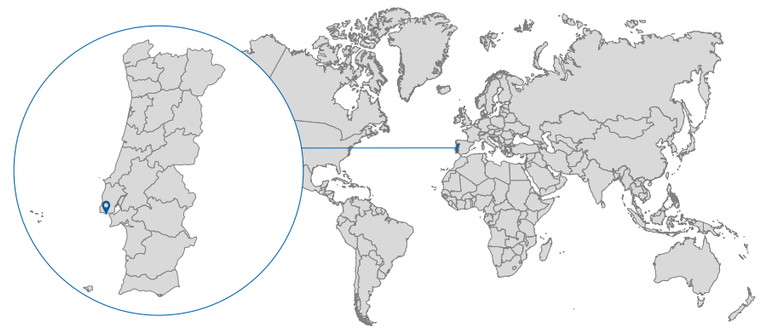
bluecover
Location Based Technology

CONTACT

E info@bluecover.pt
W www.bluecover.pt
T +351 217 158 232

Nuno Duro Santos [Managing partner]
nduro@bluecover.pt

WORLD PRESENCE
Cascais [PT]



INDUSTRY

TECHNOLOGY DOMAIN

- ✓ Software
- ✓ Hardware
- ✓ Services
- Other

SEGMENT

- Space Segment
- Ground Segment
- Launchers
- ✓ Downstream
- Generic

SUB DOMAIN

- Space System Software
- Automation, Telepresence & Robotics
- Life & Physical Sciences

NON-SPACE SECTORS OF ACTIVITY

- Robotics
- Forest
- Environment

Bold Robotics

Engineered to thrive.

Bold Robotics Lda. is a spinoff company of the University of Coimbra, dedicated to turning state-of-the-art research and technology into actual products and systems. We have a multidisciplinary highly skilled team with expertise in multiple areas such as mechanics, robotics, autonomous systems, artificial intelligence, and remote sensing, applied to sectors of activity such as the environment, forest and wildfire management.
We aim to fulfil the highest standards and the most ambitious goals, to deliver our clients a superior solution. Our mission is to impact society and the environment, leading to a better world where technology answers our needs. You envision, we make it!

PRODUCTS/ SERVICES

[1] **Forest fuel mapping using satellite and UAV collected data** [TRL 4]
Bold Robotics is combines satellite and drone collected multispectral and structural data, through novel data fusion algorithms, to generate high temporal and spatial resolution 3D semantic maps, for forest and urban interface land management purposes.

[2] **Forest fuel management digital platform** [TRL 4]
Informat is our digital platform where our client can manage its properties and assets, taking advantage of the high detail maps generated from satellite and drone data, and our management guidelines towards forest land resilience and productivity.

[3] **Fully electric autonomous robots for forest fuel management** [TRL 4]
Bold Robotics is currently developing a state-of-the-art fully electric forest management framework comprised of autonomous robots for forest fuel management and support battery charging stations.

[1] Bold Robotics high capacity land mapping UAV
[2] Rendering of our light UGV platform for unstructured environments

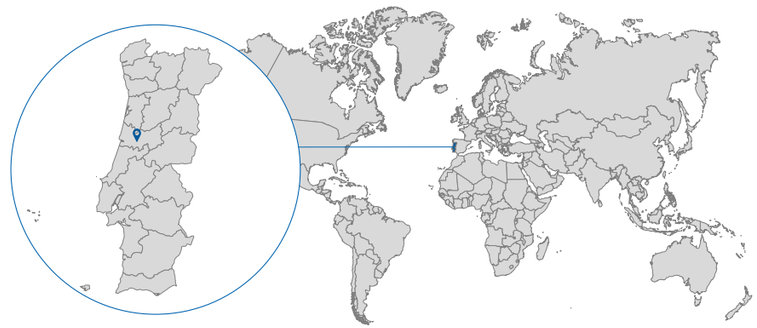
EST. 2019 Coimbra [PT] José Gameiro [CEO]

CONTACT

E info@boldrobotics.pt
W www.boldrobotics.pt
T +351 916 293 241

Carlos Viegas [COO]
info@boldrobotics.pt

WORLD PRESENCE
Coimbra [PT]



INDUSTRY

TECHNOLOGY DOMAIN

- ✓ Software
- ✓ Hardware
- ✓ Services
- Other

SEGMENT

- ✓ Space Segment
- ✓ Ground Segment
- Launchers
- Downstream
- Generic

SUB DOMAIN

- RF Systems, Payloads and Technologies
- System Design & Verification
- Ground Station System and Networks

NON-SPACE SECTORS OF ACTIVITY

- Defence
- Science
- Telecommunications
- Aeronautics

Celestia Portugal

Celestia Portugal is your development partner for space communication or ground support equipment technologies.

Celestia Portugal is a high-tech company, from the Celestia Technologies Group, devoted to offering and delivering electronic engineering services to the Aerospace industry. Our qualified team of engineers is able to perform design, development, assembly, integration and testing of hardware and software systems applied to the Aeronautical and Space sectors, including digital signal processing, software development, radiofrequency, antennas, and custom solutions and products in any of the following market sectors: Defence, Science, and Telecommunications.

PRODUCTS/ SERVICES

[1] **Embedded Systems Development Services**
Celestia Portugal provides services on research and development of embedded custom computing architectures for high-performance, low-power, RF and on-board processing.

[2] **Electrical Ground Support Equipment** [TRL 9]
To be used by satellite and sub-system manufacturers and integrators to test and validate electrical functions of the satellite on the ground before launch.

[3] **Telemetry and Telecommand (TM/TC) Special Checkout Equipment SCOE** [TRL 9]
It provides direct control of spacecraft, using baseband interfaces during spacecraft development, assembly, integration, test (AIT) and launch phases.

[1] EGSE Equipment
[2] Celestia Portugal engineers working on a new project
[3] TM/TC SCOE

EST. 2016 | Lisbon [PT] | José Alonso [CEO]

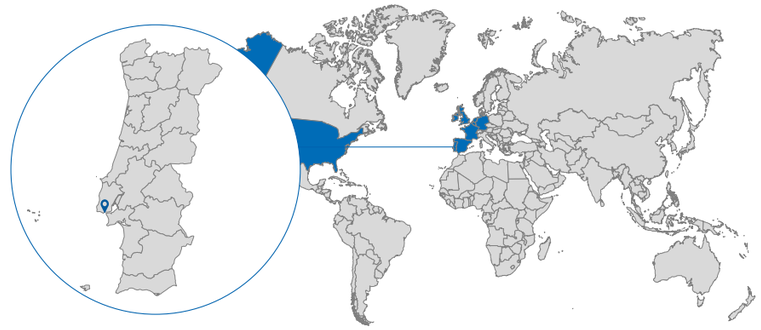
CELESTIA PORTUGAL

CONTACT

E info@celestia-portugal.pt
W www.celestia-portugal.pt
T +351 217 500 445

Rui Policarpo Duarte
[Managing Director]
rduarte@celestia-portugal.pt

WORLD PRESENCE
Lisbon [PT]; Spain; The Netherlands; UK; France; Ireland; Germany; Belgium; USA



INDUSTRY

TECHNOLOGY DOMAIN

- ✓ Software
- Hardware
- ✓ Services
- Other

SEGMENT

- Space Segment
- Ground Segment
- Launchers
- ✓ Downstream
- Generic

SUB DOMAIN

- › Other:
  Earth Observation

Cosmos Pics

See the invisible.

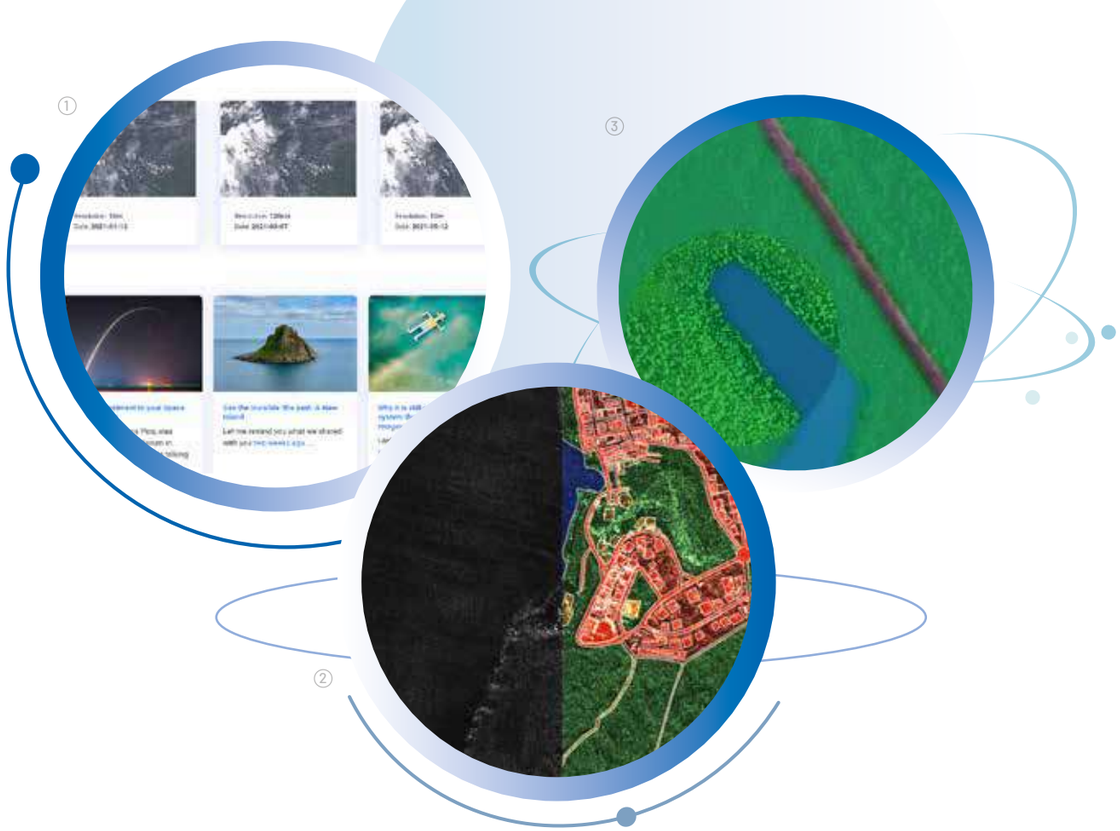
We believe that businesses should fight a global issue. Ours is climate change. We do this from space.
We help see the invisible through a no-code DIY platform ready to use in 1 day to acquire, analyse & visualise satellite images and be delivered to clients in a deployable application. We offer 100s of different analyses and require no prior tech or geographic information system knowledge.

PRODUCTS/ SERVICES

[1] **Cosmos Pics platform - ANALYSE**
As a user, you can request satellite image analyses based on analysis templates - e.g. defensible spaces for wildfire mitigation, oil spills detection in the oceans, object detection and many more. The analysis template then acquires satellite images (free and commercial), runs the analysis, visualizes the results and notifies the user. New customer analyses can be added on demand.

[2] **Cosmos Pics platform - ACQUIRE**
As a user, you can search for, view price quotes and buy commercial satellite images which can later be used for the satellite image analyses on the platform. The platform allows the users to upload their existing satellite images to the library so all images owned by the user can be gathered in the same place. We also offer an Area of Interest (AOI) library to store all the user's polygons of geographic coordinates.

[3] **Cosmos Pics platform - DEPLOY**
As a user, you can create your satellite image analysis platform using Cosmos Pics and deploy it on your website/web app.
Your end-users will see your own brand and visual identity with the text powered by Cosmos Pics at the bottom of the platform.



[1] Cosmos Pics home page
[2] Radar image analysis (left - original image, right - analysis layer)
[3] Two types of optical image analyses

EST. 2020 · Lisbon [PT] · Katia Stambolieva [CEO]

cosmos pics

CONTACT

E hello@cosmos.pics
W https://cosmos.pics
T +351 932 341 176

Katia Stambolieva [CEO]
katia@cosmos.pics

WORLD PRESENCE
Lisbon [PT]

INDUSTRY

TECHNOLOGY DOMAIN

- ✓ Software
- Hardware
- ✓ Services
- Other

SEGMENT

- ✓ Space Segment
- ✓ Ground Segment
- ✓ Launchers
- ✓ Downstream
- Generic

SUB DOMAIN

- Onboard Data Systems
- Space System Software
- System Design & Verification

NON-SPACE SECTORS OF ACTIVITY

- Aeronautics
- Automotive
- Defence & Security
- Railway
- Medical Devices
- Industry & Automation
- Energy & Utilities
- Financial Services
- Government
- e-Commerce
- Telecommunications

Critical Software

The future is ours to shape.

Founded in 1998, Critical Software is an international technology company providing trusted solutions and services for safety, mission and business-critical information systems, meeting the most demanding standards for software safety and performance.

PRODUCTS/ SERVICES

[1] **On-board Embedded Software Engineering**
With a heritage of 25+ missions, Critical Software acts as prime or tier 1 on the specification, design, development, verification and validation of embedded, real-time on-board software for full upstream segment including Flight Software (OBC, Equipment and ICU) and onboard data processing solutions.

[2] **Downstream & Infrastructures Software Engineering**
Critical Software provides Software Engineering services for downstream solutions including the development & validation of data processing tools and "Control, Data Access and Communication" applications for critical infrastructures.

[3] **Safety-Critical Verification and Validation and ISVV**
On-board Software validation, AIT support and onboard V&V support. Validation projects may be supported by KhronoSim, our own modular and customizable SVF.
ISVV: with unmatched experience, Critical Software is also the first author of the new ISVV Handbook and co-author of the ISVV Standard.

CERTIFICATION/ S:

►CMMI-DEV® Maturity Level 5 ►ISO 9001 ►EN 9100
►ISO & IEC 27001 ►Investors in People Gold ►B Corporation

[1] Orbital debris removal mission. Critical Software is the Flight Software prime contractor and provides mission Software Validation Facility
[2] CSW Software Validation Facility has been used in projects ranging from Space applications to Aerospace and Railway
[3] Earth Observation. Critical Software provided Independent Software Verification and Validation of the onboard flight software

Critical software

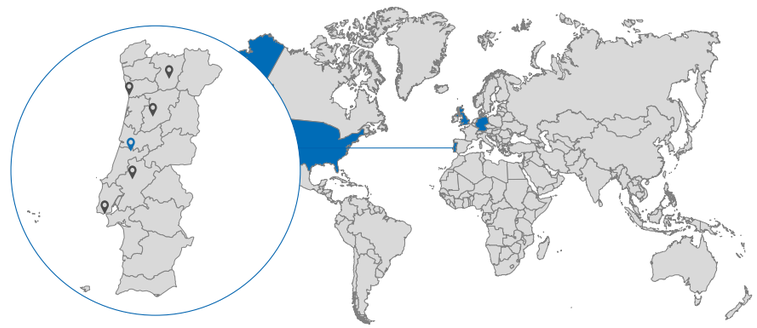
EST. 1998 | Coimbra [PT] | João Carreira [CEO]

CONTACT

E info@criticalsoftware.com
W www.criticalsoftware.com
T +351 239 989 100

Rodrigo Pascoal
[Business Development Manager]
rodrigo.pascoal@criticalsoftware.com

WORLD PRESENCE
Lisbon, Porto, Tomar, Vila Real, Viseu [PT]; Southampton, Derby [UK]; Munich [DE]; Sunnyvale [USA]



Artist's impression depicts a temperate exoplanet in our Milky Way – Space astrometry is recognized as a domain of European expertise, namely through ESA's Gaia mission, of which Portugal is part. Portuguese industry and academia are also participating in the trio of exoplanet missions CHEOPS, PLATO and ARIEL, which will progressively expand our knowledge of the type and variety of exoplanets in our galaxy, promoting their characterization.

INDUSTRY

TECHNOLOGY DOMAIN

- ✓ Software
- Hardware
- ✓ Services
- Other

SEGMENT

- Space Segment
- Ground Segment
- Launchers
- ✓ Downstream
- Generic

SUB DOMAIN

- Services
- Other: Earth Observation

NON-SPACE SECTORS OF ACTIVITY

- Environmental Studies
- Legal Audit
- Law Enforcement
- Insurance

CybELE

Taking the Earth's Pulse.

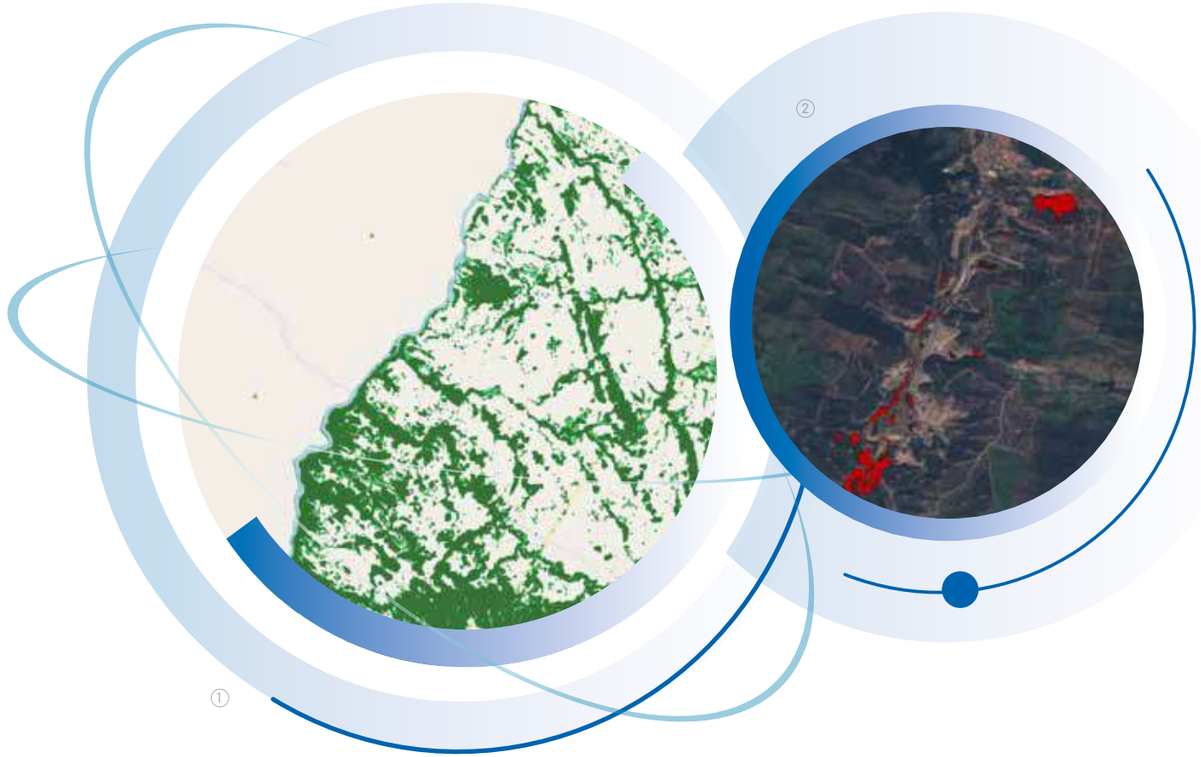
CybELE provides support in the form of geospatial data analytics based on satellite imagery to monitor compliance with any environmental legislation. CybELE develops a unique approach combining Earth Observation, web development and legal science and offer unique, simple and fast access to SatEO data and analysis in different sectors (forestry, mining, ucture, maritime). Our products and services alleviate time and money consuming research for all end users involved in environmental legal compliance or law enforcement activities. CybELE products and services are dedicated to both public institutions (law enforcement agencies, governmental bodies) as well as the private sector (law firms, insurance companies, companies implementing best practices, civil society organizations).

PRODUCTS/ SERVICES

[1] **Supply of reports providing satellite based data analytics for the monitoring of environmental status**

[2] **Satellite-based detection and monitoring systems for mining activities**

[3] **Web Platform access to satellite imagery and SatEO data analytics to support environmental monitoring**



[1] Forestry monitoring
[2] Mining monitoring

EST. 2018 Lisbon [PT] Robin Bouvier

CYBELE

CONTACT

E direction@cybele.space
W www.cybele.space
T +351 211 234 133

WORLD PRESENCE
Lisbon, Cascais [PT];
Bruxelles [BE]

INDUSTRY

TECHNOLOGY DOMAIN

- ✓ Software
- ✓ Hardware
- ✓ Services
- Other

SEGMENT

- ✓ Space Segment
- ✓ Ground Segment
- ✓ Launchers
- Downstream
- Generic

SUB DOMAIN

- › Space Debris
- › Services
- › Other:
  On-orbit Logistics

D-Orbit

> **In-space servicing and transportation to enable profitable business and human expansion in a sustainable space.**

D-Orbit is a market leader in the space logistics and transportation services industry with a track record of space-proven technologies and successful missions. Founded in 2011, before the dawn of the New Space market, D-Orbit is the first company addressing the logistics needs of the space market. D-Orbit PT's main focus is Aurora, a cloud-based software that manages the ground network, the antennae and ground stations, as well as the control of the actual satellites.

PRODUCTS/ SERVICES

[1] **AURORA**
Cloud-based software that manages the ground network, the antennae, and ground stations, as well as the control of the actual satellites. D-Orbit works with ground station providers [such as Leaf Space, Amazon Ground Station, and others] to provide global connectivity to customers.

[2] **ION Launch Services**
ION Launch Service is an end-to-end launch procurement, hosting, and deployment service that leverages ION Satellite Carrier, a dispenser manufactured and operated by D-Orbit that transports spacecraft into the desired operational orbit and deploy them into precise orbital slots, testing, transportation, and launch and deployment insurance.

CERTIFICATION/ S:

- ▶ ISO 9001:2008 - Transitioned to ISO 9001: 2015 in 2017
- ▶ UNI EN 9100:2009 - Transitioned to ISO 9100:2016 in 2017
- ▶ B-Corp; Benefit Corporation

[1] ION Satellite Carrier, a satellite platform able to deploy satellites in dedicated orbits and perform IODs during the same mission
[2] D-Sense, a multi-sensors module that can track the position of the Sun, the Earth's horizon, the magnetic field, and the angular rate of the spacecraft
[3] Aurora, a cloud-based mission control software suite, as displayed on the monitors of D-Orbit's Mission Control Center

EST. 2014 | Lisbon [PT] | Luca Rossettini [CEO]

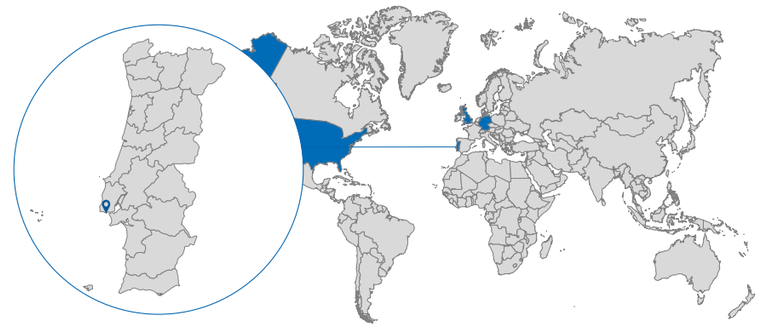
CONTACT

E info.pt@dorbit.space
W www.dorbit.space
T +351 212 696 710

Bruno Carvalho [Director]
bruno.carvalho@dorbit.space

WORLD PRESENCE

Lisbon [PT]; Como [IT];
Harwell [UK]; Washington DC [USA]



INDUSTRY

TECHNOLOGY DOMAIN

- ✓ Software
- Hardware
- ✓ Services
- Other

SEGMENT

- ✓ Space Segment
- ✓ Ground Segment
- Launchers
- ✓ Downstream
- Generic

SUB DOMAIN

- Space System Software
- Mission Operation and Ground Data Systems
- Flight Dynamics and GNSS

DEIMOS Engenharia

Leading the Space systems of tomorrow.

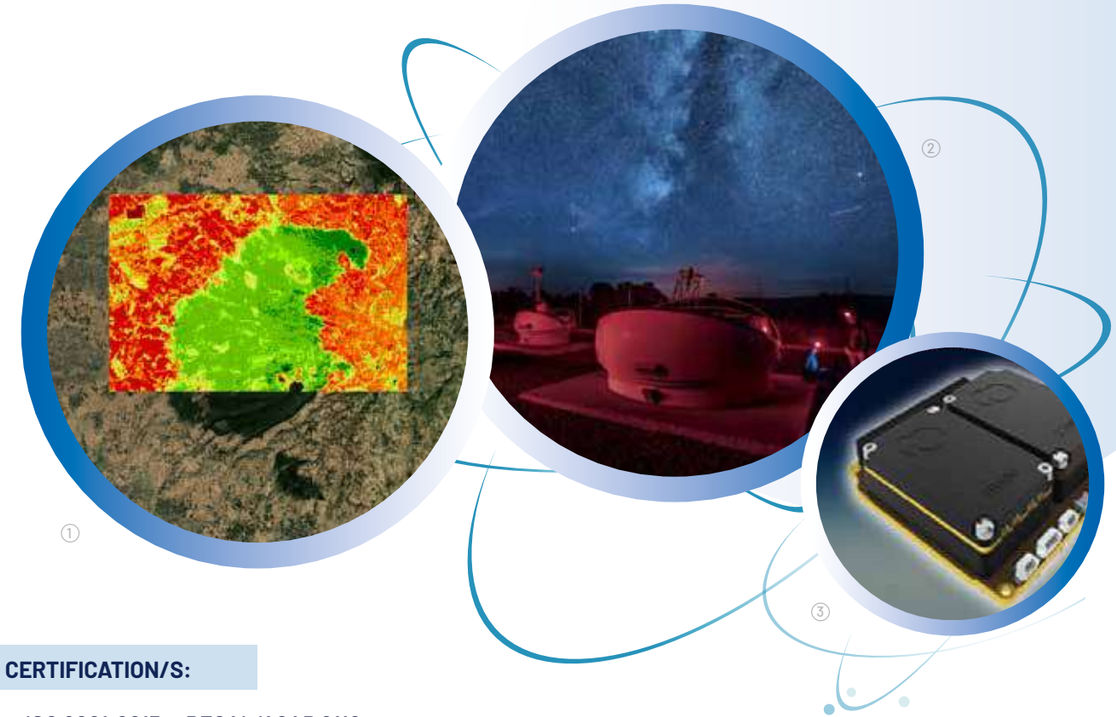
DEIMOS Engenharia is a Space Systems Engineering company, delivering advanced design solutions and turnkey space systems since 2002. Building on a solid team of highly qualified engineers, the company is a reference player in the European space sector. DEIMOS Engenharia is a DEIMOS Group company, the technology branch of ELECNOR.

PRODUCTS/ SERVICES

[1] **Flight Systems and Ground Segment**
Extensive experience in both flight and ground segment systems, playing a key role in the European Space Science, Exploration and Earth Observation programs. From end-to-end simulators to mission analysis, systems engineering and flight dynamics/attitude & orbit control [AOCS] systems to mission control, payload data processing, data distribution and Earth Observation applications, covering the whole value chain of a space mission.

[2] **GNSS**
Actively involved in all of the European GNSS programs. Responsible for three critical elements of Galileo's Ground Segment: Message Generation Facility, Mission Support Facility and Raw Data Generator. Lead activities for EGNOS v3 and Galileo 2nd Generation (G2G). Complete set of tools and products for GNSS system analysis and design. GNSS receivers for space and ground applications.

[3] **Space Safety**
Leading providers of Space Situational Operational Services in Europe, covering SST, Near-Earth Objects and Space Weather. Analysis, design, development and deployment of SSA facilities, systems and services for several customers, including the Portuguese MoD SST system.



CERTIFICATION/S:

▶ISO 9001:2015 ▶PECAL/AQAP 2110
▶ISO 14001:2015 ▶ISO 27001:2014

[1] SERVICES4EO platform for Agriculture applications
[2] DEIMOS Sky Survey facilities featured in National Geographic Magazine
[3] G3STAR GNSS Receiver for Cubesats

EST. 2002 | Lisbon [PT] | Ismael Lopez [CEO]

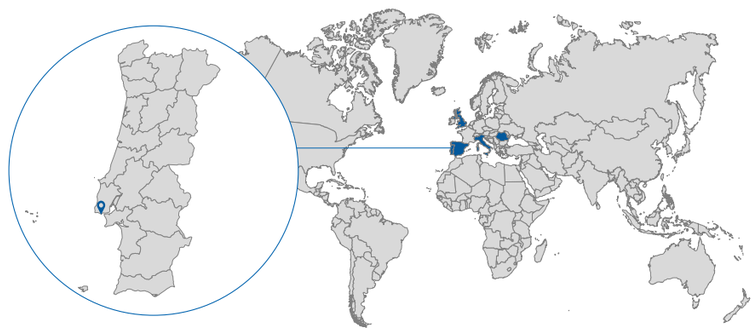
CONTACT

E info@deimos.com.pt
W www.elecnor-deimos.com
T +351 218 933 010

Nuno Ávila [Country Manager Portugal]
nuno.avila@deimos.com.pt

WORLD PRESENCE

Lisbon [PT]; Madrid, Puertollano, Valladolid, Málaga [ES]; Hardwell [UK]; Bucarest [RO]; San Pietro Mosezzo [IT]



ESA's Solar Orbiter mission, launched with technology made in Portugal by Active Space Technologies, Critical Software and Deimos Engenharia, will face the Sun from within the orbit of Mercury at its closest approach.

INDUSTRY

TECHNOLOGY DOMAIN

- ✓ Software
- ✓ Hardware
- ✓ Services
- Other

SEGMENT

- ✓ Space Segment
- ✓ Ground Segment
- Launchers
- ✓ Downstream
- Generic

SUB DOMAIN

- Space System Software
- Mission Operation and Ground Data systems
- Services

NON-SPACE SECTORS OF ACTIVITY

- Defence
- Naval
- Maritime
- Aeronautics
- Cybersecurity
- Telecommunications

EDISOFT

Engineering Solutions Without Borders.

EDISOFT has a long-standing experience in system development and integration in the domains of Defence and Security, including Naval Systems and Maritime Security, and offers products and services to markets such as Space Systems, Air Traffic Management, Telecommunications, and Cybersecurity.

PRODUCTS/ SERVICES

[1] **RTEMS - Onboard Software [OBSW]**
The RTEMS by EDISOFT is a Real-Time Operating System [RTOS] currently being used in dozens of satellites, including the Galileo Full Operational Capability [FOC], and on track to be used in many more. Developed under contract from ESA, it demonstrates the capability to produce on-board software with the highest quality standards. Missions: Galileo, EarthCare, EUCLID, ExoMars Rover, GOKTURK3, IXV, KOMPSAT-6, MTG, PLATO, smallGEO, SENTINEL and Solar Orbiter.

[2] **Electrical Ground Support Equipment [EGSE]**
EDISOFT's EGSE product is capable of testing each individual component of a satellite, the integration of its subsystems and the complete satellite. The software is based on ESA SCOS-2000 standard technology. Missions: The EGSE has been used in the ESAIL satellite and will support the new Triton-X mission led by LuxSpace.

[3] **OceanEye - Earth Observation for maritime surveillance [EO]**
OceanEye is a product that EDISOFT developed and uses to provide EO services for the maritime sector. By processing Synthetic Aperture Radar [SAR] and Satellite AIS data, EDISOFT provides Neal Real Time downstream services to EMSA (CleanSeaNet) and FRONTEX, able to detect and identify ships at sea, to deter illegal activities (smuggling, piracy, terrorism, illegal migration). OceanEye is an answer for Maritime pollution monitoring with its SAR-based oil spill detection.

CERTIFICATION/S:

►ISO 9001:2015 ►AQAP-2110 Edition D, Version 1

[1] EDISOFT Teleport in Santa Maria, Azores
[2] OceanEye Earth Observation services
[3] EDISOFT Electrical Ground Support Equipment [EGSE]

EDISOFT
DEFENCE & AEROSPACE TECHNOLOGIES
A THALES Group Company

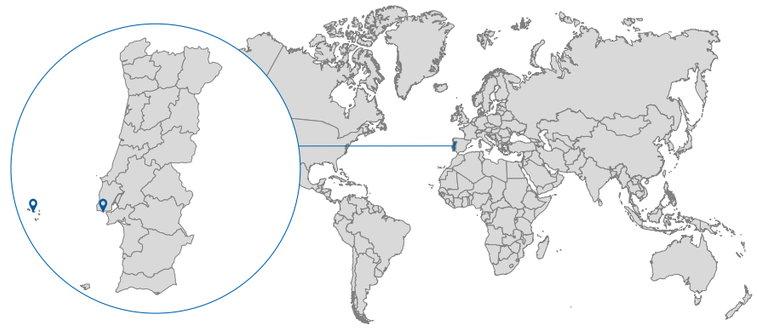
EST. 1988 | Oeiras [PT] | Sérgio Barbedo [CEO]

CONTACT

E edisoft@edisoft.pt
W www.edisoft.pt
T +351 212 945 900

José Luís Sousa Freitas
[Space Systems Sales & Business Development]
jose.freitas@edisoft.pt

WORLD PRESENCE
Lisbon, Santa Maria - Azores [PT]



INDUSTRY

TECHNOLOGY DOMAIN

- Software
- ✓ Hardware
- Services
- Other

SEGMENT

- ✓ Space Segment
- Ground Segment
- Launchers
- Downstream
- Generic

SUB DOMAIN

- › Spacecraft Electrical Power
- › Spacecraft Environments and Effects
- › System Design & Verification

NON-SPACE SECTORS OF ACTIVITY

- › Energy
- › Environment
- › Transportation

Efacec

Empowering the Future.

Founded in 1948, Efacec is the largest Portuguese Group in the electric field, present in several countries, exporting to all continents. Efacec is focused on developing products and systems for infrastructural sectors as Energy, Environment, Industry, Transportation, Electric Mobility and Space.

PRODUCTS/ SERVICES

[1] **Radiation Monitor** [TRL 9]
Efacec developed three different units: MFS (on board Alphasat), BERM (on board BepiColombo) and RADEM (to be on board JUICE). RADEM is a significant evolution from the previous units. It has 3 dedicated stacks of detectors to measure and differentiate the different kinds of space energy particles as well as a directional detector to acknowledge the direction of the particles.

[2] **Solar Array Health Monitor** [TRL 9]
On the JUICE mission Efacec was responsible for two similar flight units that will monitor the health of JUICE solar arrays during its journey to the Jovian system. These units are equipped with a dosimeter, which will establish a relationship between the radiation received by the solar arrays and its overall health.

[3] **RADAR and LIDAR Altimeters** [TRL 6]
EFACEC has developed both RADAR and LIDAR instruments. In the first Efacec is developing an Engineering Model, in the second Efacec was awarded with HERA mission Planetary Altimeter (PALT) that is a ToF Altimeter with pulsed laser technology that will help the space-craft on guidance and also scientific tasks.

CERTIFICATION/ S:

▶ESA qualified soldering process for flight hardware

[1] RADAR Altimeter, Breadboard Model
[2] Radiation Monitor for JUICE mission, Qualification Model
[3] Solar Arrays Health Monitor for JUICE mission

EST. 1948 | Maia [PT] | Ângelo Ramalho [CEO]

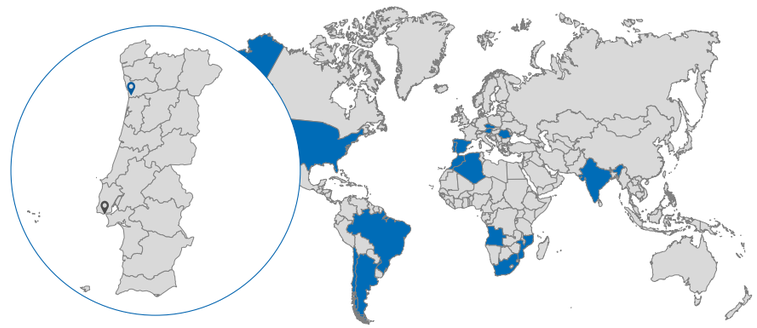
efacec

CONTACT

E aerospace@efacec.com
W www.efacec.com
T +351 229 402 000

Vasco Granadeiro [Head of Aerospace]
vasco.granadeiro@efacec.com

WORLD PRESENCE
Porto, Lisbon [PT]; Spain; Czech Republic; Romania; Austria; Brazil; Argentina; Chile; USA; Angola; Mozambique; South Africa; Algeria; Morocco; India



INDUSTRY

TECHNOLOGY DOMAIN

- Software
- Hardware
- ✓ Services
- Other

SEGMENT

- Space Segment
- Ground Segment
- Launchers
- Downstream
- ✓ Generic

SUB DOMAIN

- › Mechanisms
- › Materials and Processes
- › Other: Engineering Services

NON-SPACE SECTORS OF ACTIVITY

- › Aeronautics
- › Automotive
- › Prototyping
- › Machining
- › Casting Industry

Engenhotec

Simplify with Technology.

Since its creation, the vision of Engenhotec has been to offer to its customers competing globally engineering products and systems development.
Over the years, the services have been enlarged with the machining of high precision prototypes, moulds, tooling, metal 3D sintering, high precision finishing, and rheology engineering of mould injection.
For satisfying the innovation driven by the customers of the most advanced sectors we offer a disruptive approach. A key expertise and experience in a wide range of materials. Complex Products and Systems design and development integrating the Engineering Systems Methodologies, with a solid experience and practice in vehicles development. Product development engineering is conducted using the most advanced 3D software.

PRODUCTS/ SERVICES

[1] **3D modelling of components and 2D drawing specifications under AVIO's directives for ESA project**

[2] **Fixtures, tooling for aeronautic parts production for OGMA/Embraer**

[3] **Prototypes, Machining jigs and equipment for testing for VEGA E new launcher**

CERTIFICATION/ S:

▶ISO 9001-2015

[1] Tool for composite part
[2] Tool for parts riveting
[3] Tool for parts riveting

EST. 2004 Gondomar [PT] Miguel Oliveira [CEO]

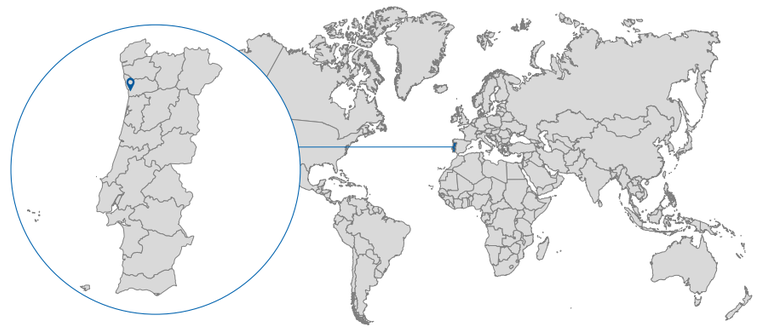
engenhotec
Product Engineering and Prototyping

CONTACT

E engenhotec@engenhotec.com
W www.engenhotec.com
T +351 224 644 027

Miguel Oliveira [CEO]
engenhotec@engenhotec.com

WORLD PRESENCE
Gondomar [PT]



INDUSTRY

TECHNOLOGY DOMAIN

- Software
- ✓ Hardware
- ✓ Services
- Other

SEGMENT

- ✓ Space Segment
- Ground Segment
- Launchers
- Downstream
- ✓ Generic

SUB DOMAIN

- › Mechanisms
- › Structures
- › Thermal

NON-SPACE SECTORS OF ACTIVITY

- › Wind
- › Industrial Automation

Eptune Engineering

Bringing new space products to market.

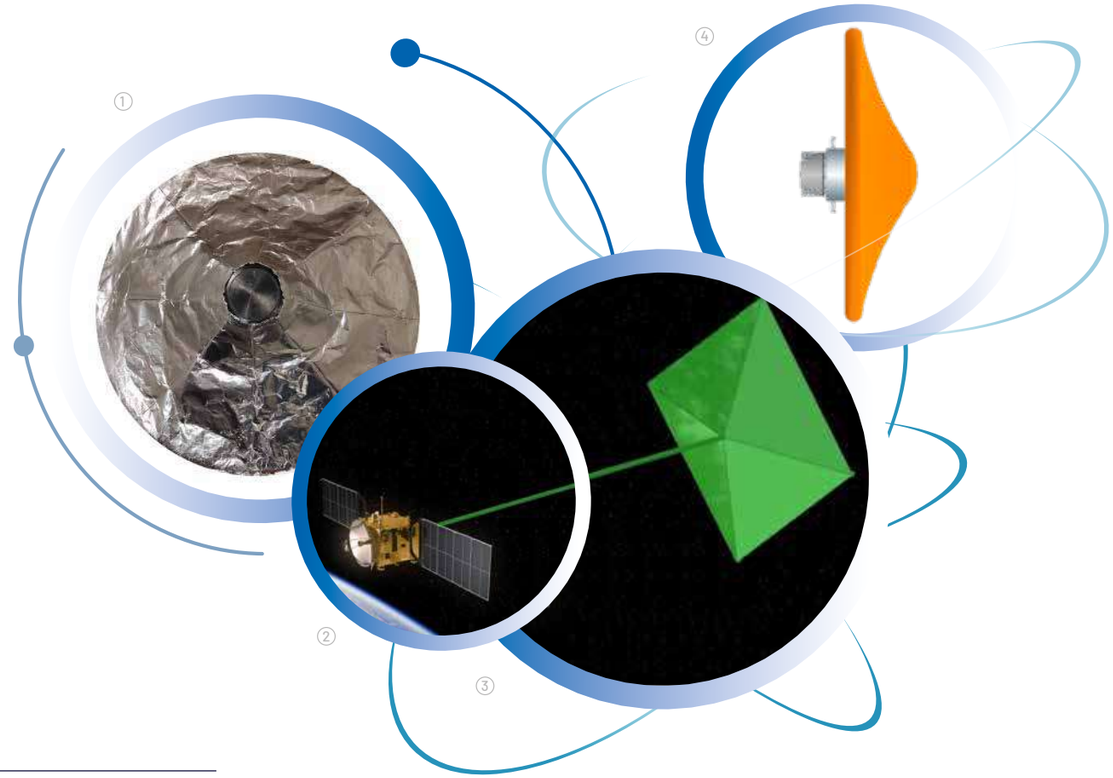
Eptune Engineering is a product-driven company dedicated to the development of new solutions for the Space and Wind industries. We are a team of engineers where the business and technology go hand in hand to bring innovative & valuable products to the market.

PRODUCTS/ SERVICES

[1] **Inflatable Structures** [TRL 4]
Eptune is developing inflatable drag devices for Aerobraking and Aerocapture of scientific satellites and re-entry of launcher structures.

[2] **De-orbiting systems** [TRL 4]
Eptune is designing and producing inflatable drag device for satellites in end of life, to accelerate de-orbiting time.

[2] **Engineering Services**
The Eptune team has a long heritage on space product management and development of structures, mechanisms, and thermal design - a service we are supplying to some European Original Equipment Manufacturer (OEM).



[1] Ballute prototype
[2+3] De-orbiting ballute for clean space
[4] Aerocapture ballute design concept

EST. 2018 | Matosinhos [PT] | João Pedro Loureiro [CEO]

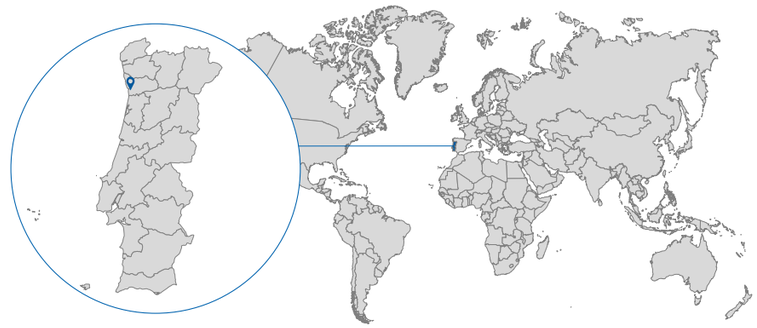
EPTUNE ENGINEERING

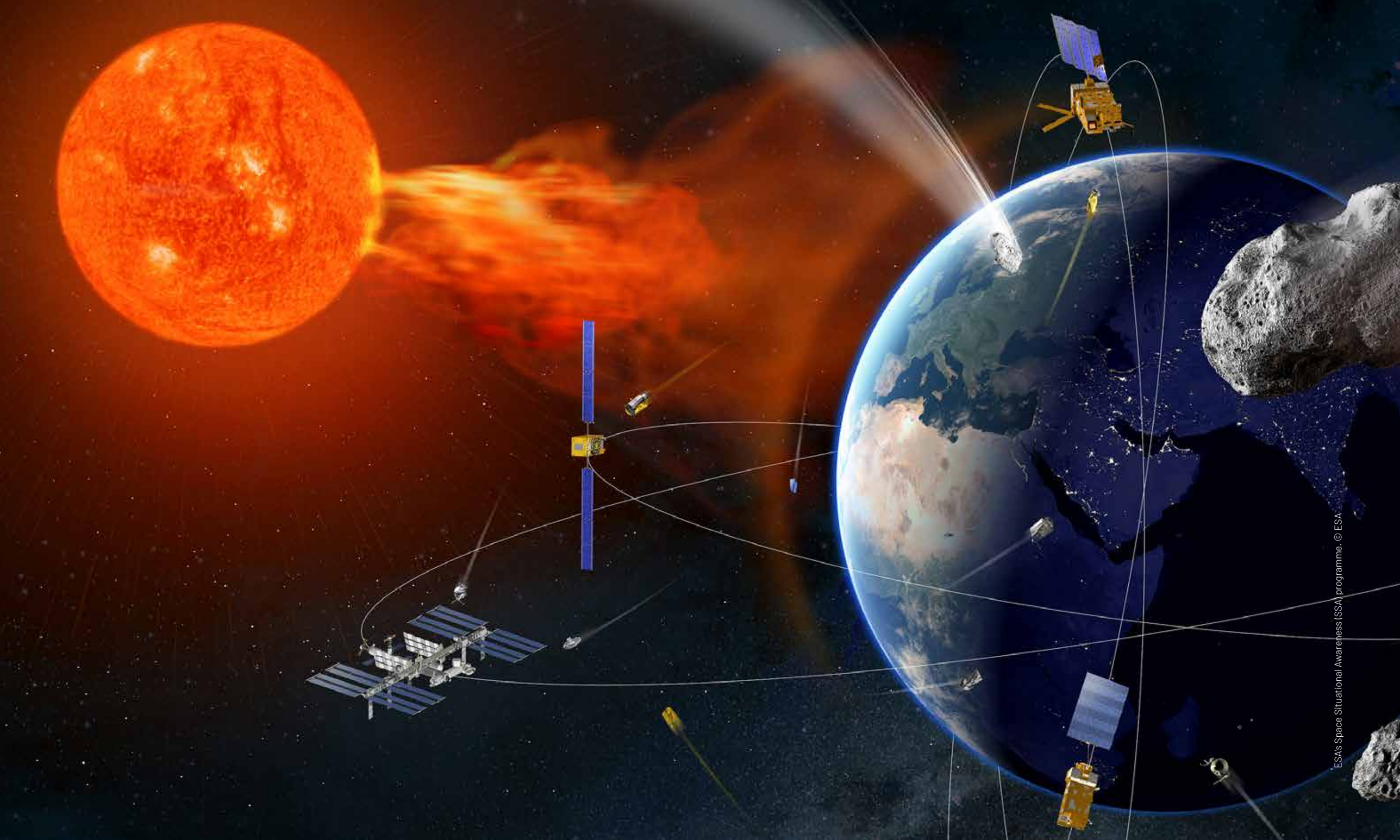
CONTACT

E info@eptune-engineering.com
W www.eptune-engineering.com
T +351 220 301 586

João Pedro Loureiro [CEO]
pedro.loureiro@eptune-engineering.com

WORLD PRESENCE
Matosinhos [PT]





ESA's Space Situational Awareness (SSA) programme. © ESA

INDUSTRY

TECHNOLOGY DOMAIN

- ✓ Software
- ✓ Hardware
- ✓ Services
- Other

SEGMENT

- ✓ Space Segment
- ✓ Ground Segment
- Launchers
- Downstream
- Generic

SUB DOMAIN

- › Onboard Data Systems
- › Space System Software
- › Spacecraft Electrical Power

NON-SPACE SECTORS OF ACTIVITY

- › Railways
- › Industrial IoT
- › Test Platform

EVOLEO Technologies

> **Take on a technological challenge that will one day change society.**

EVOLEO Technologies is an SME dedicated to the design of reliable electronic, electromechanical and software systems. It designs, builds and integrates embedded and computational solutions upon monitoring, data processing, and intelligence software. It can provide vertical system integration for small/ medium size solutions.

PRODUCTS/ SERVICES

[1] **On-board Computer – OBC/ICU/Digital Control** [TRL 9]
EVOLEO develops compact, performant and reliable RadHard and NewSpace on-board computers and digital control units to support payloads or satellite main subsystems.

[2] **Power Supply, Control and Distribution – PSDU** [TRL 9]
Design of compact, multi-output protected power supply distribution units to support small satellite buses, payloads or ISS experiments.

[3] **Electrical Ground Support Systems – EGSE/SCOE** [TRL 9]
Design and development of SCOE and integrated EGSE for payload or subsystems testing, including power, backend and frontend test systems.

CERTIFICATION/ S:

▶ISO9001-2015

[1] Compact OBC - RadHard
[2] EGSE for small satellites or payloads
[3] PSDU for ISS Instrument

EST. 2007 | Maia [PT] | Rodolfo Martins [CEO]

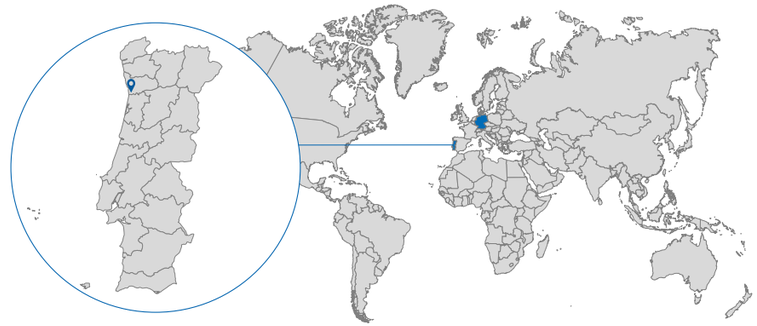
EVOLEO TECHNOLOGIES

CONTACT

E info@evoleotech.com
W www.evoleotech.com
T +351 229 424 327

Rodolfo Martins [CEO]
rodolfo.martins@evoleotech.com

WORLD PRESENCE
Maia [PT];
Munich [DE]



INDUSTRY

TECHNOLOGY DOMAIN

- Software
- Hardware
- ✓ Services
- Other

SEGMENT

- Space Segment
- Ground Segment
- Launchers
- ✓ Downstream
- Generic

SUB DOMAIN

- › Space System Software
- › Flight Dynamics and GNSS

Eye2Map

Geosolutions for Environment and Engineering.

Eye2Map is a company with a focus on drone Mapping, Image Processing and Geographic Information services using Remote Sensing and Photogrammetry techniques applied to the Environment and Engineering.

PRODUCTS/ SERVICES

[1] **Geographical information**
Eye2Map supplies geographical information products such as cartography, topography and cadastre, using aerial imagery either by drone, airplane or satellite and relying on GNSS RTK receivers for precise georeferencing of all data, both aerial and on the ground.

[2] **Multispectral Imaging**
The company provides high resolution multispectral aerial imaging for agriculture applications as a complement on satellite data for crop harvesting, production estimation and disease detection.
With Thermal imaging, besides agriculture, it is also used in geological applications and inspection of renewable energy generators such as solar panels and wind turbines.

[3] **3D Modeling**
With drone, close photos and precise measurements, the company can create accurate virtual representations of real buildings, places or objects that can be used in engineering projects, museums, gaming industry and furthermore.

[1] Mapping Vineyards
[2] Preparing Fixed Wing Flight
[3] GNSS RTK usage for precision georreferencing

EST. 2015 | Porto [PT] | Óscar Moutinho [CEO]

CONTACT

E oscarmoutinho@eye2map.com
W www.eye2map.com
T +351 913 584 812

Óscar Moutinho [CEO]
oscarmoutinho@eye2map.com

WORLD PRESENCE
Porto [PT]

INDUSTRY

TECHNOLOGY DOMAIN

- Software
- ✓ Hardware
- ✓ Services
- Other

SEGMENT

- ✓ Space Segment
- ✓ Ground Segment
- ✓ Launchers
- Downstream
- Generic

SUB DOMAIN

- › Structures
- › Thermal
- › Services

NON-SPACE SECTORS OF ACTIVITY

- › Cryogenics
- › Materials and Processes

FHP – Frezite High Performance

One Step Forward.

FHP is an engineering company working mainly for the space industry for 15 years already, with 10+ flight hardware in operation. The company's purpose is to deliver high performing items to our Customers in the mechanical engineering field. Our core business is divided in 3 main topics, namely the Thermal Hardware - with its core product MLI blankets, providing design, manufacturing and integration; the Mechanical Hardware - with mechanical ground support equipment design and manufacturing of MGSEs ranging from transport containers to turning and handling devices and housings; and the Lightweight Materials Components - with the design and manufacturing of CFRP/GFRP, Booms and, COPVs and deployable structures. In addition, FHP provides structural and thermal analysis as a service too, as well as bake-out services in its state-of-the-art bake-out chamber coupled to its cleanrooms.

PRODUCTS/ SERVICES

[1] **Thermal Hardware** [TRL 9]
MLI blankets for spacecrafts and instruments
Missions: AlphaSat, ExoMars, Grace-FO, eROSITA, CHEOPS, Constellations

[2] **Mechanical/LMC Hardware** [TRL 9]
MGSEs and housings
Missions: EUCLID, JUICE, METimage

[3] **Services: structural/thermal analysis and bake-out services**
Missions: EUCLID, JUICE, PLATO, PROBA-3

CERTIFICATION/ S:

▶EN 9100 ▶ISO 9001

[1] CFRP struts used on deployable structures
[2] eROSITA Telescope MLI blankets integration
[3] JUICE TDM [Thermal Development Model] integration with its MGSEs

EST. 2007 Porto [PT] Tiago Fernandes [CEO]

CONTACT

E commercial@frezitehp.com
W www.frezitehp.com
T +351 220 045 400

Miguel Santos
[Comercial Business Manager]
miguel.santos@frezitehp.com

WORLD PRESENCE
Porto [PT]

INDUSTRY

TECHNOLOGY DOMAIN

- Software
- Hardware
- ✓ Services
- Other

SEGMENT

- Space Segment
- Ground Segment
- Launchers
- ✓ Downstream
- Generic

SUB DOMAIN

- › Mission Operation and Ground Data systems
- › Services
- › Other: Earth Observation

NON-SPACE SECTORS OF ACTIVITY

- › Agriculture
- › Urban Planning
- › Environmental Monitoring
- › Forestry
- › Natural Resources Management
- › Emergency Management

GEOSAT

GEOSAT is aimed at providing EO services to leverage our customers business models and activities, operating its own satellites and tailoring solutions to fit the specific needs of Institutional, Defence, Scientific and Commercial users.

GEOSAT delivers Earth Observation products and services, based on very high resolution and wide coverage imagery from proprietary and partner satellites. In-house experts and analytics power services to provide near real-time and ready to use insights to our customers.

PRODUCTS/ SERVICES

GEOSAT provides fully operational products and services [TRL9]

[1] **Satellite imagery**
GEOSAT-2 provides Very High Resolution imagery: 75cm @ 12km swath and related image bundles from Panchromatic + RGB + NIR; Stereo images and wideview. GEOSAT-1 Wideview imagery: 22m @ 625km swath and related image bundles from RG + NIR

[2] Rush and priority tasking and delivery for global **Near Real-Time services**

[3] **Insights** for vertical markets from GEOSAT 1&2 and partner's data.

CERTIFICATION/ S:

►ISO9100 ►ISO14001

[1] Bali, Indonesia; GEOSAT-2 VHR Image (75cm)
[2] Lisbon, Portugal; GEOSAT-2 VHR Image (75cm)
[3] Lisbon and Tagus valley, Portugal; GEOSAT-1 Wideview (20m)

EST. 2021 Évora [PT] Francisco Vilhena da Cunha [CEO]

GEOSAT
Global Earth Observation Satellites

CONTACT

E info@geosat.space
W www.geosat.space

Afonso Martins
[Business development manager]
afonso.martins@geosat.space

WORLD PRESENCE
Évora, Monte da Caparica, Matosinhos [PT];
Boecillo, Madrid, Puertollano [ES]

INDUSTRY

TECHNOLOGY DOMAIN

- ✓ Software
- ✓ Hardware
- ✓ Services
- Other

SEGMENT

- ✓ Space Segment
- ✓ Ground Segment
- ✓ Launchers
- ✓ Downstream
- Generic

SUB DOMAIN

- Mission Operation and Ground Data systems
- Flight Dynamics and GNSS
- Space Debris

NON-SPACE SECTORS OF ACTIVITY

- Aeronautics
- Banking
- Insurance
- Defence
- Health
- Cybersecurity
- Intelligent Transportation Systems
- Automotive
- Telecommunications

GMV

Innovating Solutions.

GMV is a privately owned technological business group with an international presence. Founded in 1984, GMV offers its solutions, services and products in very diverse sectors: Aeronautics, Banking and Finances, Space, Defence, Health, Cybersecurity, Intelligent Transportation Systems, Automotive, Telecommunications, and IT.

PRODUCTS/ SERVICES

[1] **Downstream Services and Applications** [TRL 9]
Copernicus Services:
Security and Emergency Management
Monitoring Station for GNSS precise positioning applications
GNSS Receiver Technologies

[2] **Ground Segment** [TRL 9]
Ground Segment Products (SATCOM, EO, Scientific)
Space Surveillance and Tracking
EGSE (Galileo Radio Frequency Constellation Simulator, Central Checkout Systems)

[3] **Space Segment** [TRL 6]
GNC/ AOCS technologies (autonomy, in-orbit servicing, launcher and interplanetary)
Avionics and On-board Software (e.g. AIR Hypervisor)
Simulators and Laboratory tools and infrastructure (e.g. Space Rider)

CERTIFICATION/ S:

▶CMMI Level 5 ▶UNE-EN ISO 9001:2015 ▶UNE-EN ISO 9001:2015
▶ISO 14001:2015 ▶ISO/IEC 27001:2013 ▶UNE-EN 9100:2018

[1] Earth Observation Services
[2] Avionics
[3] Ground Segment

EST. 1984 | Lisbon [PT] | Alberto de Pedro [Managing Director]

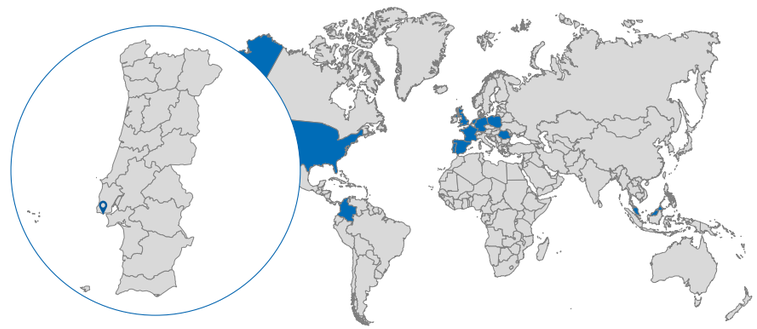
gmv INNOVATING SOLUTIONS

CONTACT

E marketing@gmv.com
W www.gmv.com
T +351 213 829 366

Teresa Ferreira
[Director of Space Portugal]
space.portugal@gmv.com

WORLD PRESENCE
Lisbon [PT]; Colombia; France; Germany; Malaysia; Netherlands; Poland; Romania; Spain; USA; UK



The Jupiter Icy Moons Explorer (JUICE) is an ESA mission that will explore Jupiter and three of its icy moons: Ganymede, Callisto and Europa. The spacecraft, that counts with the participation of several Portuguese companies such as Efacec, GMV, Deimos Engenharia, Active Space Technologies, FHP and LusoSpace, is expected to launch in 2022 and reach the Jovian System in 2029. It will acquire invaluable data of Jupiter and its system allowing to learn more about gas giants in the solar system and beyond, and explore the potential for the emergence of life in similar systems.

INDUSTRY

TECHNOLOGY DOMAIN

- Software
- Hardware
- ✓ Services
- Other

SEGMENT

- ✓ Space Segment
- Ground Segment
- Launchers
- Downstream
- ✓ Generic

SUB DOMAIN

- › Services
- › Other: Space Business Strategy & Development
- › Other: Internationalisation and Export Support

Ilex Space

Because space is hard, we make it easier!

Ilex Space aims at providing a holistic view of space missions, as space is becoming, seamlessly, ever more part of our lives. Ilex Space is focused in helping "New Space" companies, and established industry players, develop their business, that will flourish into the space of the future.

PRODUCTS/ SERVICES

[1] **Business Strategy & Business Development:**
Ilex Space main focus and expertise in the commercialization of Space, in its various aspects.
• Validation and expansion of your customer base;
• Engagement with institutional and commercial partners;

[2] **Technology transfer**
Ilex Space is actively marketing space assets and technologies in other markets, fostering innovative solutions to tackle global problems.
• Test business cases and the market's requirements;
• Consolidate partnerships to deliver end-to-end solutions

[3] **Scaling businesses**
Ilex Space aims to support growth and therefore to expand and scale up businesses, offering strategic advice in:
• Funding mechanisms to help develop the product or service [raise TRL];
• Supply chain management and delivery

[1] Ursa Major constellation above Cabo do Sardão – Finding new paths!
[2] Sede - Lagoas Park, Edificio 7

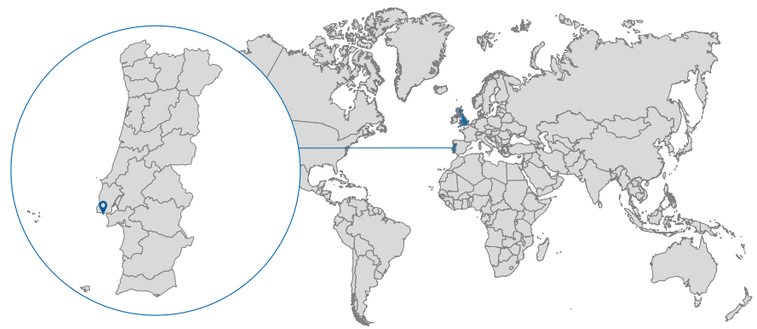
EST. 2017 | Oeiras [PT] | Bruno Carvalho [CEO]

CONTACT

E info@ilex.space
W www. ilex.space
T +351 211 224 748

Bruno Carvalho [CEO]
bcarvalho@ilex.space

WORLD PRESENCE
Oeiras [PT];
Harwell [UK]



INDUSTRY

TECHNOLOGY DOMAIN

- ✓ Software
- Hardware
- ✓ Services
- Other

SEGMENT

- Space Segment
- Ground Segment
- Launchers
- ✓ Downstream
- Generic

SUB DOMAIN

- Life & Physical Sciences
- Services
- Other: Earth Observation Platforms

NON-SPACE SECTORS OF ACTIVITY

- Computer Vision
- Artificial Intelligence
- Machine Learning
- Augmented Reality and VR
- Intelligent Process Automation

K-1-DIGITAL

Technology that moves your business.

K1 DIGITAL is a Digital Transformation company focused in 4th industrial revolution technologies integration with operation and business operations of companies.

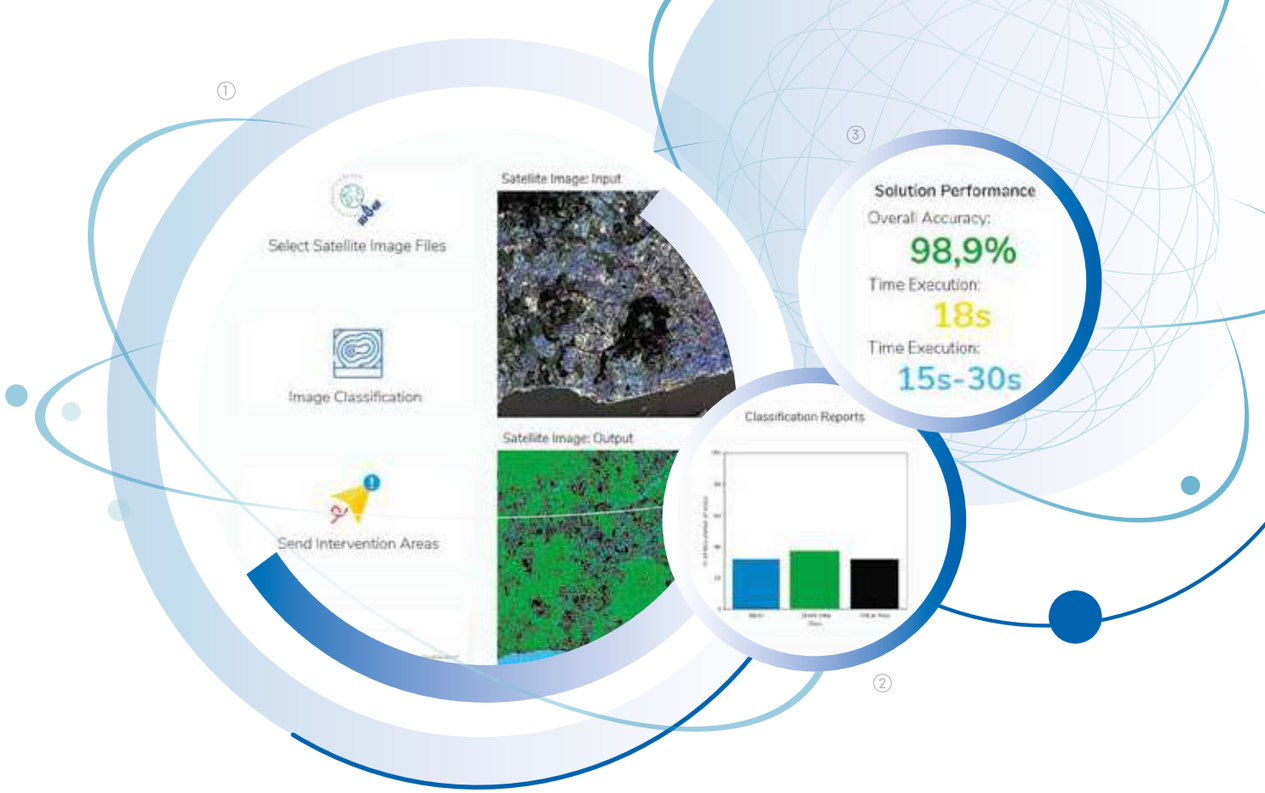
PRODUCTS/ SERVICES

Our **Earth Observation [EO] solution** detects changes in the territory and predicts risk situations based on high-accurate predictive machine learning models incorporating Space Technologies. Based on multispectral and optical satellite images integrated with different data sources, our EO platform allows developing a reliable action and prevention plans.

Our platform can be used to detect anomalous situations, providing accurate insights in several sectors [agro-industry, land and sea monitoring, among others]. We consider our platform in TRL 3.

CERTIFICATION/ S:

- ▶ Hyper-automation in UiPath
- ▶ UiPath Technology
- ▶ Microsoft
- ▶ Knowledge Management and Business Intelligence
- ▶ Python
- ▶ R



[1+2+3] Earth Observation and Artificial Intelligence K1 Platform

EST. 2017 Lisbon [PT] Paula Adrião [CEO]

K1 Digital
TECHNOLOGY THAT MOVES YOUR BUSINESS

CONTACT

E paula.adriao@k-1-digital.com
W www. k-1-digital.com
T +351 933 803 598

WORLD PRESENCE
Lisbon [PT]
São Paulo, Rio de Janeiro [BR]

INDUSTRY

TECHNOLOGY DOMAIN

- Software
- ✓ Hardware
- Services
- Other

SEGMENT

- Space Segment
- ✓ Ground Segment
- Launchers
- Downstream
- Generic

SUB DOMAIN

- › RF Systems, Payloads and Technologies
- › Space Debris
- › Ground Station System and Networks

NON-SPACE SECTORS OF ACTIVITY

- › Scientific Instrumentation
- › Physics

LC-Technologies

> **The heart of science is measurement.**
>
> — Erik Brynjolfsson

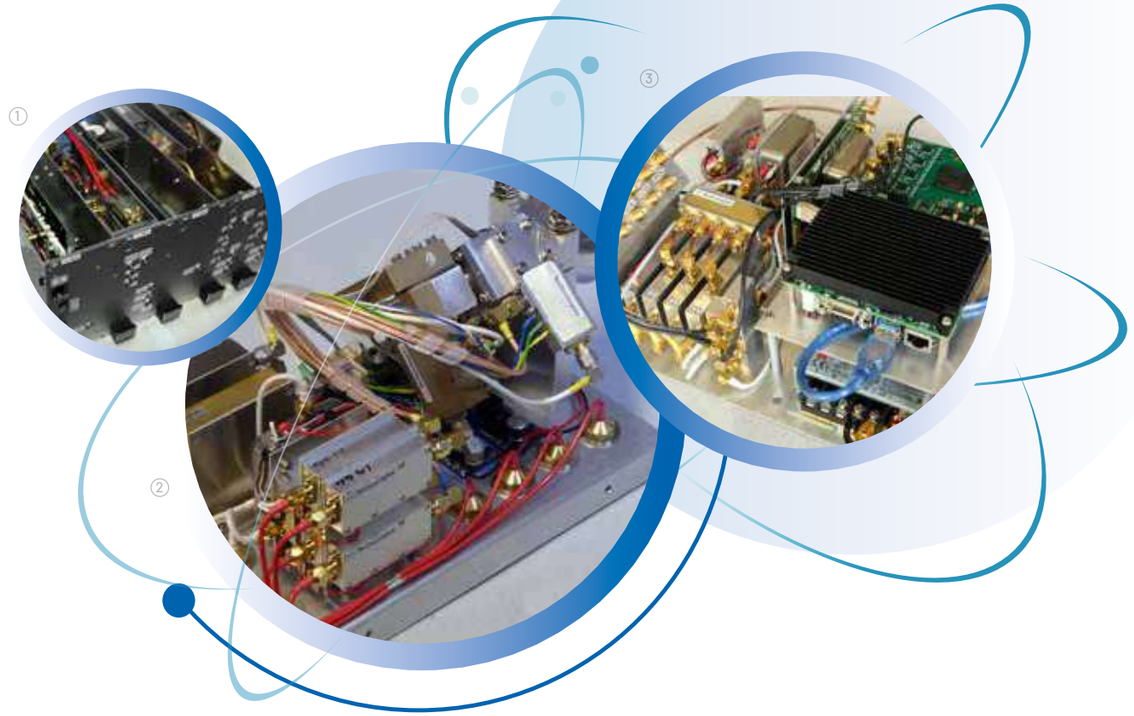
LC Technologies is a small company born out of a long background (more then 20 years) developing innovative high tech devices and microwaves/ millimetre-waves instrumentation for international projects and research centres. We rely on a small team and well-equipped laboratories capable of dealing with demanding Microwave, Millimeter-wave and Sub-millimeter-wave technologies in order to provide state of the art designs and engineering expertise, offering from custom specialized modules up to complete scientific instruments targeting scientific research, R&D labs, and industry.

PRODUCTS/ SERVICES

[1] **Ground Station Measurement Terminals for propagation research:** Millimetre-wave ground stations for technology and science research. These are a custom-made scientific instruments that can operate at frequencies from lower microwaves into the millimetre-wave range. Specified case by case.

[2] **Custom made Laboratory Instrumentation:** at millimetre-wave and sub-millimetre-wave with application on materials research, atomic microscopy and other research fields. These are custom-made scientific instruments that can operate at frequencies from lower microwaves into the millimeter-wave range.

[3] **Millimeter-wave Reflectometry [and interferometry] diagnostics for plasma physics:** Instrumentation for the diagnostic of nuclear fusion reactors, plasma physics research, either laboratory or space plasmas. LC-Tech is the main provider worldwide of such type of instrumentation.



[1] Modular instrumentation, rack-mount, millimeter-wave, multi channel plasma-physics diagnostic
[2] 4 channel dual polarity Low Noise Block converter for Alphasat measurement ground station
[3] Interferometer for millimeter-wave tracking of space signals (3 channel SDR correlation system)

EST. 2013 · Aveiro [PT] · Luis Cupido [CEO]

LC Technologies
Aveiro - Portugal

CONTACT

E luis@cupidotech.com
W www.cupidotech.com
T +351 234 283 611

Luis Cupido [CEO]
luis@cupidotech.com

WORLD PRESENCE
Aveiro [PT]

INDUSTRY

TECHNOLOGY DOMAIN

- ✓ Software
- Hardware
- ✓ Services
- Other

SEGMENT

- Space Segment
- Ground Segment
- Launchers
- ✓ Downstream
- Generic

SUB DOMAIN

- › Other: Geospatial Services

NON-SPACE SECTORS OF ACTIVITY

- › Real Estate
- › Smart Cities
- › Transportation
- › Tourism

Localista Tech

location, location, location.

Localista.tech is an IT company that provides innovative geospatial services and products for real estate, smart cities, transportation, and tourism.
All our products are aim to leverage the digital transformation of these industries to create value for their customers through an online-to-offline approach – from high tech to human experiences.

PRODUCTS/ SERVICES

[1] **Digital toolkit for real estate** [TRL 7]
Localista is the SaaS toolkit that empowers brokers to stand out from the competition by maximizing efficiency and customer experience, because it provides an immediate report about the amenities within reach of a given property, it enhances customer qualification and buyer-seller matchmaking, and integrates seamlessly with the brokers' CRM and website.

[2] **Digital toolkit for wayfinding** [TRL 4]
Meant for the tourism sector (vacation rentals and hotels) and transportation (authorities and service providers), the wayfinding toolkit allows end-customers to locate themselves and explore amenities and attractions within reach easily.

[1] Most house-seekers start their search via online channels
[2] Explore and compare how the location of listed properties fits the mobility needs and desired lifestyle of home-seekers
[3] A new way to engage with house-seekers, to increase the conversion rate, and accelerate sales

EST. 2019 | Coimbra [PT] | João Bigotte [Co-founder]

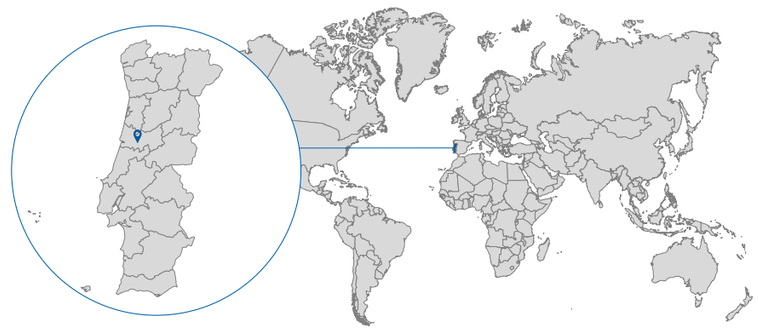
localista

CONTACT

E info@localista.tech
W https://localista.tech
T +351 934 293 382

João Bigotte [Co-founder]
info@localista.tech

WORLD PRESENCE
Coimbra [PT]



INDUSTRY

TECHNOLOGY DOMAIN

- Software
- ✓ Hardware
- Services
- Other

SEGMENT

- ✓ Space Segment
- ✓ Ground Segment
- Launchers
- Downstream
- Generic

SUB DOMAIN

- › RF Systems, Payloads and Technologies
- › Ground Station System and Networks
- › Optoelectronics

NON-SPACE SECTORS OF ACTIVITY

- › Augmented Reality

Lusospace

Beyond the challenge.

Active in the Space sector since 2002, Lusospace is a high-tech engineering company working on highly critical systems. Our multidisciplinary engineering teams design, develop, integrate, and test the most advanced and innovative technologies and components.

PRODUCTS/ SERVICES

[1] **Magnetometer** [TRL 9]
Several missions as Sentinel 1/3/5 series, Radarsat Constellation, Biomass, Aeolus, Proba-2, and others.

[2] **Augmented Reality for AIT** [TRL 7]
Development of an augmented reality tool that allows any user to include procedures and 3D models for increasing the efficiency, reliability and traceability of the AIT of systems.

[3] **Optics/Optoelectronics subsystems [OGSE, Optical communications, LISA High Power Laser]** [TRL 7]
We have been developing several optics and optoelectronics subsystems with one new product for laser communications that will fly in Dec 2021.

CERTIFICATION/ S:

- ▶ ISO 9001-2015
- ▶ ECSS-Q-70-08C: Certification for hand soldering for space application

[1] Optolectronics
[2] Laser Head for Optical communication
[3] Augmented Reality for AIT

EST. 2002 · Lisbon [PT] · Ivo Vieira [CEO]

lusospace

CONTACT

E info@lusospace.com
W www.lusospace.com
T +351 211 165 020

Ivo Vieira [CMO]
marketing@lusospace.com

WORLD PRESENCE
Lisbon, Samora Correia [PT];
Odense [DK]

Launching in 2025, ClearSpace-1 will use robotic arms to capture part of a Vespa upper stage leftover from ESA's second Vega launch in 2013. Four Portuguese companies are part of the project: Deimos Engenharia, Critical Software, ISQ and LusoSpace, being the first time in history that Portuguese companies lead a mission's subsystem.

INDUSTRY

TECHNOLOGY DOMAIN

- ✓ Software
- Hardware
- ✓ Services
- Other

SEGMENT

- Space Segment
- Ground Segment
- Launchers
- ✓ Downstream
- Generic

SUB DOMAIN

- › Other: Earth Observation

NON-SPACE SECTORS OF ACTIVITY

- › Construction
- › Smart Cities

MATEREO

Bring predictability, down to the construction sector.

MATEREO is developing a global solution for risk prediction in key critical infrastructure components, like bridges, tunnels, and dams. MATEREO uses artificial intelligence and InSAR Data, enabling early damage detection through the assessment of pre-failure deformation, essential to provide information that helps mitigate hazards and improve user safety.

PRODUCTS/ SERVICES

[1] **MATEREO's cloud-based software for infrastructures monitoring** combines Civil Engineering with Data Science and is a scalable solution that can be implemented worldwide to monitor critical assets (bridges, viaducts, land slopes, embankments, subsidences, etc.) with high precision and remotely. Our software for infrastructures monitoring with InSAR data integration is currently at the stage TRL 5 – BETA version and actively working to achieve the level of TRL 7 – Early Adopter version.

[1] IMS experience
[2] Remote Monitoring of a Portuguese Bridge
[3] IMS advantages

EST. 2014 | Coimbra [PT] | Jorge Alexandre Vieira [CEO]

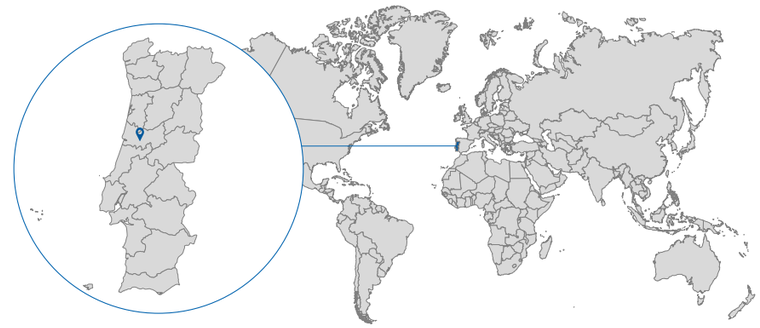
MATEREO
BRIDGE MONITORING WITH PREDICTIVE INTELLIGENCE

CONTACT

E matereo@matereo.com
W www.matereo.com
T +351 239 160 318

Jorge Alexandre Vieira
[Founder and CEO]
jorgealexandrevieira@matereo.com

WORLD PRESENCE
Coimbra [PT]



INDUSTRY

TECHNOLOGY DOMAIN

- ✓ Software
- Hardware
- ✓ Services
- Other

SEGMENT

- ✓ Space Segment
- ✓ Ground Segment
- Launchers
- ✓ Downstream
- Generic

SUB DOMAIN

- Onboard Data Systems
- Mission Operation and Ground Data systems
- Space Debris

NON-SPACE SECTORS OF ACTIVITY

- Energy
- Media
- Transport & logistics
- Insurance
- Pharmaceutical
- Telecommunications
- Finance

ML Analytics

> **To boldly go where no AI has gone before.**

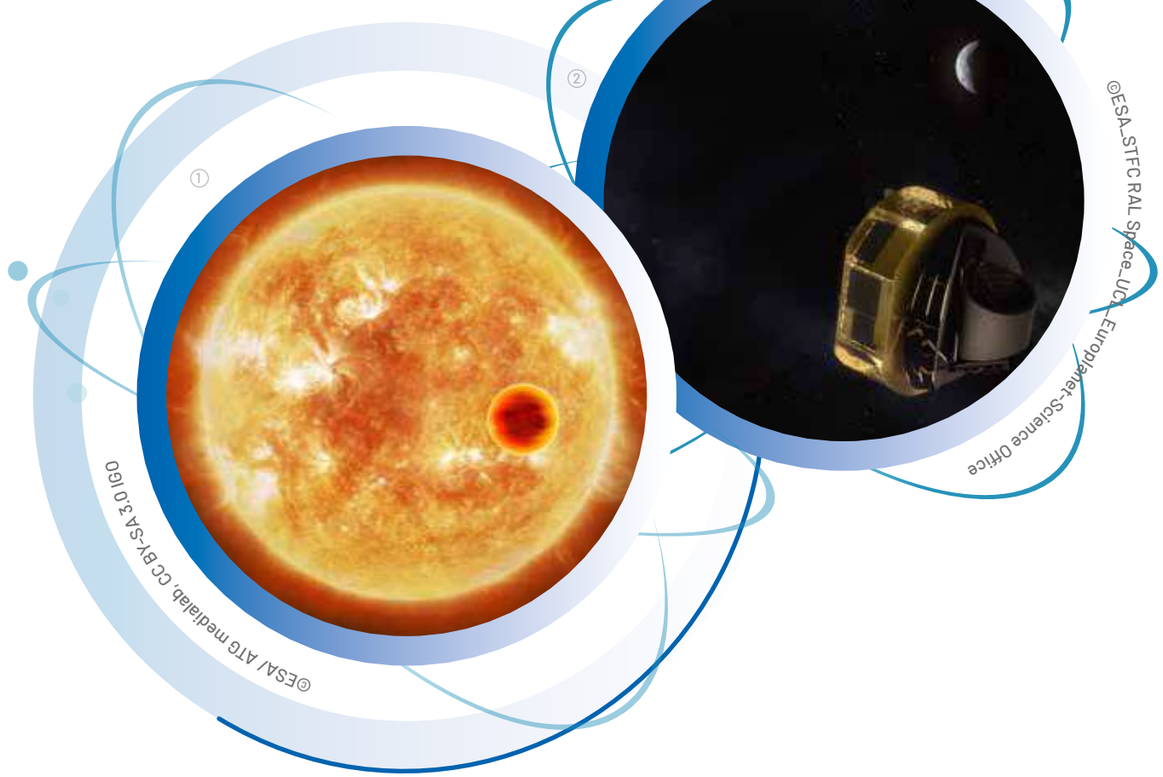
ML Analytics is a Data Science boutique that designs Artificial Intelligence algorithms to model, extract and act upon the knowledge hidden in data. In addition, it provides model validation services to ensure safe operation in critical application domains. The company excels at the later stages of a Machine Learning project's life cycle, where prediction becomes prescription and data science turns into optimization.

PRODUCTS/ SERVICES

[1] **Machine Learning model Verification & Validation.**
Automatic stress-testing of ML models to identify and characterize failure modes. Support for model repairs through synthetic data. Support models to ensure safe operation in critical application domains.

[2] **Machine Learning models of spacecraft operators' management of the Cluster II constellation.**
Deployed at ESA-ESOC. Project initiated through participation in NASA/ESA's Frontier Development Lab, a research accelerator that fosters the introduction of Artificial Intelligence into the space sector.

[3] **State-of-the-art AI/Machine Learning solutions for the space sector.**
Victory in the 2021 "Ariel Machine Learning Data Challenge" with a model to characterize exoplanets for ESA's upcoming Ariel mission. Experience with: satellite collision risk forecasting, combinatorial scheduling of satellite communications, satellite thermal power consumption forecasting, super-resolution enhancement of satellite imagery, and global trajectory optimization.



[1] An exoplanet transits in front of its star, dimming the amount of light that reaches us ML Analytics developed a state-of-the-art Machine Learning algorithm to study such light curves
[2] ESA's Ariel telescope, to be launched in 2029, will study the atmospheres of around 1000 exoplanets. ML Analytics is collaborating with the mission, to ensure it will have AI algorithms capable of processing the data the telescope will generate

ML Analytics

EST. 2018 | Loures [PT] | Marilia Simões [CEO]

CONTACT

E geral@mlanalytics.pt
W www.mlanalytics.pt
T +351 933 763 076

Luis Simões
[Chief Technical Officer & Researcher]
luis.simoes@mlanalytics.pt

WORLD PRESENCE
Loures [PT]

INDUSTRY

TECHNOLOGY DOMAIN

- ✓ Software
- Hardware
- Services
- Other

SEGMENT

- ✓ Space Segment
- ✓ Ground Segment
- Launchers
- Downstream
- Generic

SUB DOMAIN

- › Space System Software
- › Space Debris

Neuraspace

Fighting Space Debris with AI.

Neuraspace empowers satellite operators, space agencies and insurance companies on Space Traffic. Using AI and Machine Learning, we provide an automated end-to-end solution for space operations such as collision avoidance with space debris or active spacecraft. That reduces manpower efforts by 2/3 or more, the number of false alerts by 50%, the time between manoeuvre decision and close approach to below one day and savings in fuel and time in the manoeuvres by 30%.

PRODUCTS/ SERVICES

As part of its end-to-end solution [TRL 6], Neuraspace offers:

[1] **Actionable Information for Optimal Manoeuvres:** easy overview of status of assets and collision warnings, interactive plot(s) for visualization of manoeuvre parameters and recommendation for collision avoidance manoeuvres based on optimisation of parameters such as fuel consumption, service provision, separation and others, tailored to our customers.

[2] **Collision Avoidance and Mitigation:** A higher level of confidence (better than available with other products) on the probability of collision of a close encounter with warning which include information on: (1) uncertainty bounds for the upcoming week; (2) predicted time to next CDM created; (3) thresholds crossed on various parameters of significance, such as chaser's size and relative position.

[3] **Historical CDMs statistics**, including: miss distance, PoC (specific to the event), statistics of previous encounter events of the same chaser and target, and individual overall status.

Automated end-to-end solution for space operations
Ensuring that Space is a Safe Environment
AI and Machine Learning

EST. 2020 | Coimbra [PT] | Nuno Sebastião (Founder & Investor)

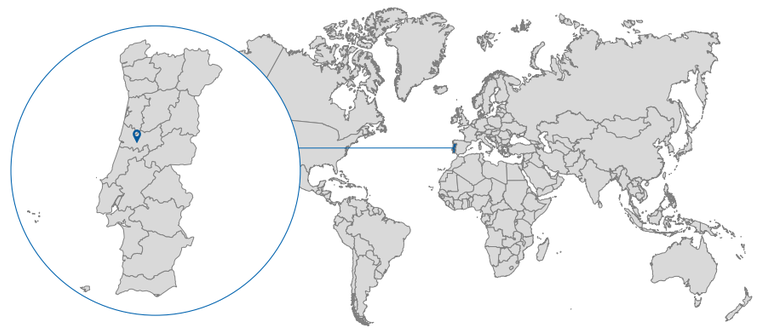
neuraspace

CONTACT

E info@neuraspace.com
W www.neuraspace.com
T +351 239 700 346

Chiara Manfletti
[COO]
chiara.manfletti@neuraspace.com

WORLD PRESENCE
Coimbra [PT]



INDUSTRY

TECHNOLOGY DOMAIN

- ✓ Software
- ✓ Hardware
- ✓ Services
- Other

SEGMENT

- ✓ Space Segment
- ✓ Ground Segment
- Launchers
- ✓ Downstream
- Generic

SUB DOMAIN

- System Design & Verification
- Mission Operation and Ground Data systems

OHB Portugal

> **Bring the expertise of a Large System Integrator as an enabler for the implementation of the Portugal space agenda.**

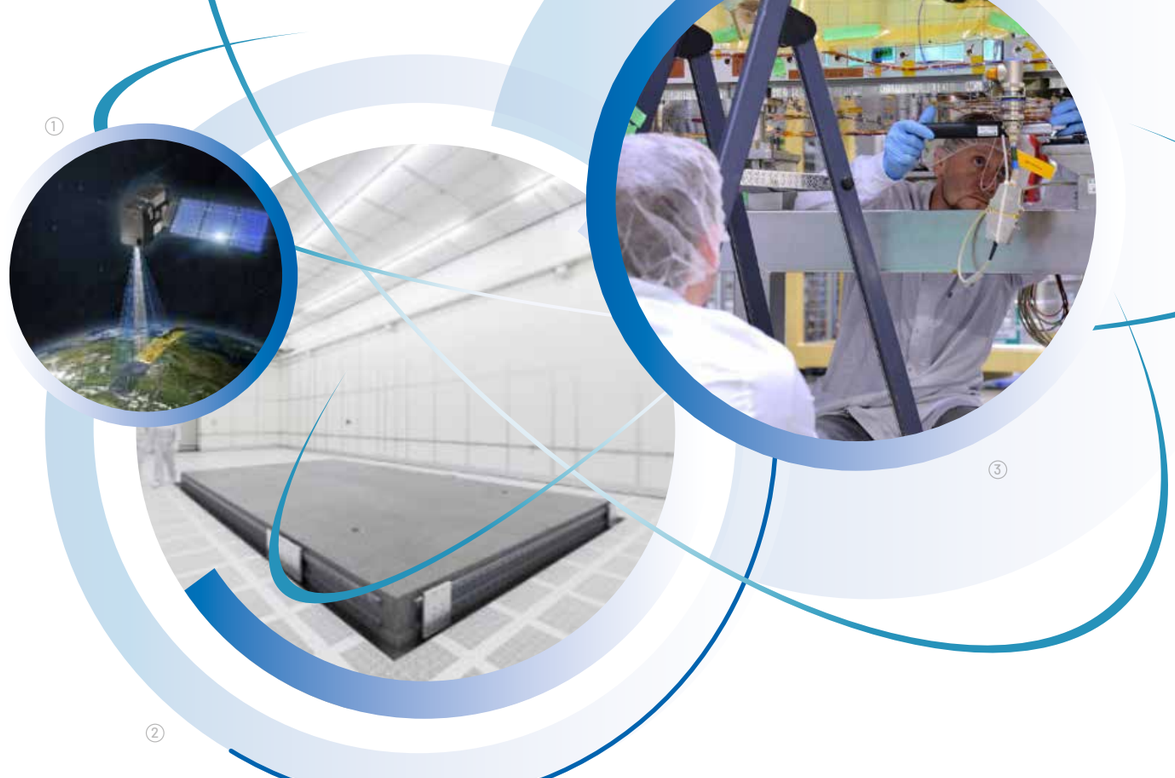
The company's object is research, development, manufacturing and distribution of aerospace products, systems and technology. The company intends to embrace and sustain the economic growth of the Portuguese space industry following the national space agenda 2030. In the first place, OHB Portugal deals with the development and implementation of micro-satellites space systems.

PRODUCTS/ SERVICES

[1] **Space Systems**
OHB group is one of the European leaders for providing end-to-end turn-key space systems, including design, development, assembly, integration and test of the space and ground segments (flight operations and data). The expertise also covers interface with the launch segment and the development of data products and services.

[2] **Micro-Satellites**
OHB group offers micro-satellite platform products that are highly scalable, reliable and versatile with possible application to Earth observation and telecommunication missions.

[3] **Space payloads**
OHB group, as one of the European leading space companies, has demonstrated its ability to develop reliable highly performant payloads for all kinds of pace missions (Earth Observation, Reconnaissance, Telecommunication, Navigation, Exploration, Science, Human Space Flight, Robotics). The know-how covers all types of payload: optical multi- and hyperspectral, SAR, microwave radiometers, telecoms, science, etc.



[1] Artist view of the Copernicus CO2 Monitoring mission
[2] Optical Payload Integration Facility ISO-5 in Oberpfaffenhofen, Germany
[3] Satellite electrical assembly

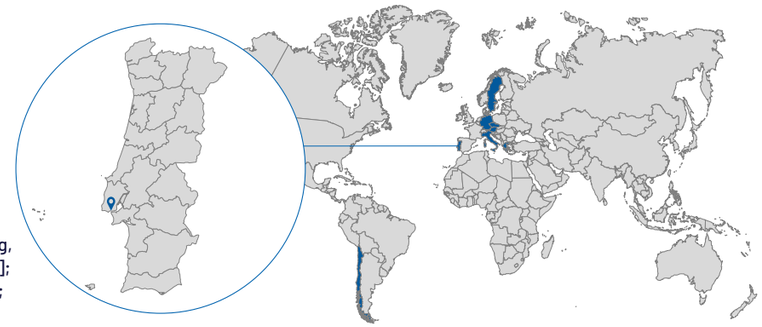
EST. 2020 | Lisbon [PT] | Sebastien Tailhades [CEO]

CONTACT

E info@ohb-portugal.pt
W www.ohb.de/en
T +351 213 304 300

Sebastien Tailhades [General Manager]
sebastien.tailhades@ohb-portugal.pt

WORLD PRESENCE
Lisbon [PT]; Bremen, Oberpfaffenhofen, Wessling, Gilching [DE]; Graz [AT]; Milan [IT]; Betzdorf [LU]; Stockholm [SE]; Klatovy, Brno [CZ]; Athens [GR]; Santiago de Chile [CL]



INDUSTRY

TECHNOLOGY DOMAIN

- Software
- ✓ Hardware
- ✓ Services
- Other

SEGMENT

- ✓ Space Segment
- Ground Segment
- ✓ Launchers
- ✓ Downstream
- Generic

SUB DOMAIN

- System Design & Verification
- Propulsion
- Materials and Processes

NON-SPACE SECTORS OF ACTIVITY

- Energy
- Advanced Manufacturing
- Airborne Platforms for EO

Omnidea

> **Our mission is to contribute to the expansion of human frontiers. We live in global system, the laws of physics mandate that the only way to ensure a common world growth is to constantly keep expanding the boundaries of our activity.**

Omnidea is an Aerospace and Energy company focused on Propulsion for satellites and rockets, Integration of aerospace platforms and energy systems, and Advanced manufacturing. Headquarters are in Portugal and operates also from its subsidiaries in Germany, UK and Greece.

PRODUCTS/ SERVICES

[1] **Satellite launcher and propulsion systems** [TRL 8]
Omnidea provides propulsion components, subsystems (e.g. valves, fluid control components and pressure vessels) and engines (10 N – 25 kN) for satellite and launcher systems

[2] **Earth observation platforms** [TRL 7]
Tethered low-altitude platform for Monitoring and Surveillance, and Satellite data calibration

[3] **Energy generation systems** [TRL 5]
Omnidea develops hydrogen generation and fuel cell systems that support the decarbonization of society.

CERTIFICATION/ S:

▶ EN9100 [Omnidea RTG]

[1] Pressure vessels
[2] Thruster for satellites
[3] Tethered Balloon

EST. 2003 | Arruda dos Vinhos; Monte da Caparica [PT] | Tiago Pardal [CEO]

Omnidea

CONTACT

E info@omnidea.net
W www.omnidea.net
T +351 211 913 169

Filipa Lourenço
[Chief Operating Officer]
direcao@omnidea.net

WORLD PRESENCE

Arruda dos Vinhos, Monte da Caparica,
Ponta Delgada - Azores [PT]; Bremen [DE]

MetOp weather satellites, essential information for weather forecasting. © ESA

INDUSTRY

TECHNOLOGY DOMAIN

- Software
- ✓ Hardware
- Services
- Other

SEGMENT

- ✓ Space Segment
- ✓ Ground Segment
- ✓ Launchers
- Downstream
- Generic

SUB DOMAIN

- › Structures
- › Materials and Processes

NON-SPACE SECTORS OF ACTIVITY

- › Automotive
- › Aeronautics

Optimal Structural Solutions

Space Structural Solutions ... from Portugal!

OPTIMAL STRUCTURAL SOLUTIONS Lda is a SME, founded in 2008, and owned by Portuguese private investors. OPTIMAL is focused on the design, development and manufacturing of advanced composite and metallic structures, tooling and ground support equipment for space, aeronautic, defence, automotive and nautical.

OPTIMAL performs its space activities in a dedicated business unit. OPTIMAL SPACE combining a dedicated team composed of engineers, product assurance and project managers with the Space mindset; ample access to the Engineering team and the production resources; and full support of the Procurement, Storage & Logistics, IT, Test and QMS staff.

PRODUCTS/ SERVICES

[1] **Satellite Structures** [TRL 5]
Optimal designs, develops and manufactures composite and metallic structures for satellites, namely aluminium and CFRP sandwich panels; aluminium, steel, INVAR and titanium complex CNC machined components (e.g. inserts, bipods, ...).

[2] **Launcher Structures** [TRL 4]
Optimal designs, develops and manufactures structural solutions for micro-launchers, namely fairings in composite materials, and metallic interface rings.

[3] **Mechanical Ground Support Equipments** [TRL 6]
Optimal designs, manufactures and tests ground support equipments for assembly, integration, testing and transportation of satellites and micro-launchers spaceport infrastructures, namely dedicated launchpads.

CERTIFICATION/ S:

▶ISO9001 ▶AS9100

[1] Example of a CFRP sandwich panel manufactured at OPTIMAL
[2] Quality control - ultrasonic inspection [Phased Array], composites and metallics

EST. 2008 | Cascais [PT] | António Reis (Director) and Manuel Torres (Director)

OPTIMAL STRUCTURAL SOLUTIONS

CONTACT

E info@optimal.pt
W www.optimal.pt
T +351 210 997 788
+351 910 031 492

Celeste Pereira
[Head of Optimal Space]
celeste.pereira@optimal.pt

WORLD PRESENCE
Cascais, Porto [PT]

INDUSTRY

TECHNOLOGY DOMAIN

- Software
- Hardware
- ✓ Services
- Other

SEGMENT

- Space Segment
- Ground Segment
- Launchers
- ✓ Downstream
- Generic

SUB DOMAIN

- › Spacecraft Environments and Effects
- › Flight Dynamics and GNSS
- › Services

NON-SPACE SECTORS OF ACTIVITY

- › IOT
- › Fintech
- › Telecom/Media
- › E-commerce
- › Aviation

Present Technologies

Increasing safety when using GNSS-based landing procedures.

Present Technologies is an innovation company with over 20 years of experience providing world-class software solutions. We work in the space sector providing GNSS and Space Weather monitoring products for the aviation sector, focused on improving the safety of GNSS-based landing procedures.

PRODUCTS/ SERVICES

[1] **SWAIR - Space Weather and GNSS monitoring services for Air Navigation**
Business Applications Demonstration Project developed by Present Technologies [Prime] in partnership with Bluecover Technologies and the Centre for Earth and Space Research of University of Coimbra [CITEUC]. SWAIR is a product for the worldwide aviation sector, compliant with international regulations and recommendations [ICAO SARPs], aiming to increase safety when using GNSS-based landing procedures, by delivering local-level operational monitoring, discontinuities forecast and performance assessment of GNSS signals. In addition, the product addresses interferences and Space Weather issues which can influence the performance and reliability of satellite positioning systems.

[1] SWAIR - GNSS Approach procedures availability monitoring
[2] SWAIR - Space Weather and GNSS monitoring services for Air Navigation
[3] SWAIR - Space Weather operational status monitoring

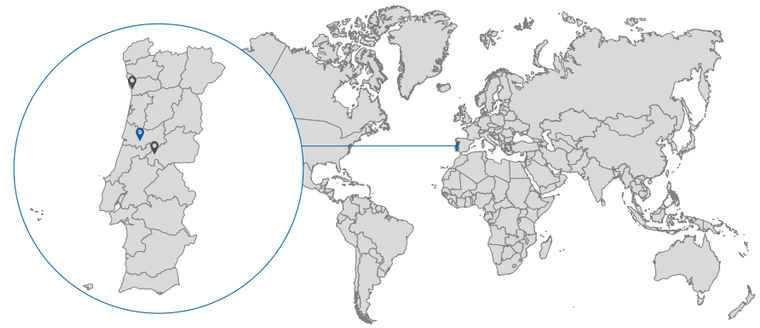
EST. 2000 · Coimbra [PT] · Victor Batista [CEO]

CONTACT

E info@present-technologies.com
W www.present-technologies.com
T +351 239 781 834

Paulo Martins [COO & Co-founder]
pmartins@present-technologies.com

WORLD PRESENCE
Coimbra, Porto, Sertã [PT]



INDUSTRY

TECHNOLOGY DOMAIN

- Software
- ✓ Hardware
- Services
- Other

SEGMENT

- Space Segment
- Ground Segment
- ✓ Launchers
- Downstream
- Generic

SUB DOMAIN

- › Structures
- › Materials and Processes
- › Other: Cost-effective CFRP Structures

RFA Portugal

Your launch into the New Space.

Rocket Factory Augsburg was founded in 2018 to reduce launch costs in the space industry significantly. The company's goal is to develop a launch vehicle prototype by the end of 2022 which can launch satellites into low Earth orbits on a weekly basis at unmatched prices. RFA Portugal plays a key role in developing and industrializing the production of CFRP-based launcher structures in Portugal.

PRODUCTS/ SERVICES

[1] **Development, manufacturing, test and verification of CFRP-based launcher structures**

[1] Structures from RFA PT deployed in space
[2+3] RFA ONE launch system

EST. 2020 Matosinhos [PT]

CONTACT

E info@rfa.space
W www.rfa.space
T +49 821 999 576 25

Jörn Spurmann
[Managing Director]
joern.spurmann@rfa.space

WORLD PRESENCE
Matosinhos [PT]; Augsburg [DE]

INDUSTRY

TECHNOLOGY DOMAIN

- Software
- Hardware
- ✓ Services
- Other

SEGMENT

- Space Segment
- Ground Segment
- Launchers
- Downstream
- ✓ Generic

SUB DOMAIN

- › Structures
- › Materials and Processes
- › Other: Machining

NON-SPACE SECTORS OF ACTIVITY

- › Automotive
- › Aeronautics
- › Military & Defence
- › Medical
- › Oil & Gas
- › Electronics

Ricardo & Barbosa

Our customers, make the world go around... We make the parts!

Created on the 1st of April 1978, Ricardo & Barbosa is one of the largest national references in the manufacture of high precision tools for Automotive, Electronics, Aeronautics and Oil & Gas industries, is currently present in more than twenty-six countries around the world. We are experts in Tooling Design & Manufacturing [including hydroforming tools], high precision machining [+/- 0,003 mm], surface treatments and Sub-Assemblies [turnkey solutions]. We have 60 CNC machines [Milling, Lathes, Flat Grinding, Cylindrical Grinding and EDM], to produce in all kinds of materials, from a single part to larger batches.

PRODUCTS/ SERVICES

[1] **ESA Mission PLATO**
Manufacturing parts to the Service Module (SVM)

[2] **ESA Mission JUICE**
Manufacturing parts to the Medium Gain Antenna Subsystem (MGAMA)

[3] **New Space**
Manufacturing parts for the OneWeb's constellation (648 LEO satellite fleet that will deliver high-speed, low-latency global connectivity).

CERTIFICATION/ S:

▶AS9100 ▶ISO9001 ▶ISO14001

[1] ESA Mission PLATO – Machining
[2] ESA Mission JUICE - Machining
[3] NEW SPACE - Machining

EST. 1978 | Porto [PT] | Maria João Barbosa [CEO]

ricardo&barbosa
mechanical mold and tool maker

CONTACT

E customer.service@ricardo-barbosa.com
W www.ricardo-barbosa.com
T +351 224 663 500

Miguel Oliveira
[General Operations Manager]
miguel.oliveira@ricardo-barbosa.com

WORLD PRESENCE

Porto [PT];
Juárez [MEX]

INDUSTRY

TECHNOLOGY DOMAIN

- Software
- ✓ Hardware
- Services
- Other

SEGMENT

- ✓ Space Segment
- ✓ Ground Segment
- ✓ Launchers
- Downstream
- Generic

SUB DOMAIN

- › EEE [Electric, Electro-mechanical & Electronic] Components and Quality
- › Other: Special Cable Assemblies
- › Other: Continuity and Insulation tests

NON-SPACE SECTORS OF ACTIVITY

- › Defence
- › Aeronautics
- › Naval
- › Railway
- › Industry
- › Mobility

Sintersa

Together we Connect.

We focus on innovation and the development of electrical connection products to meet the demands of the more than 3,000 customers who place their trust in us. At SCP-SINTERSA we design, manufacture, and supply electrical interconnection components and systems for professional applications in harsh environments. With over 35 years of experience in the aerospace, defence, railway & industrial markets, we offer customized solutions to fulfil electric interconnections needs in: components, production and on-site assembly.

PRODUCTS/ SERVICES

[1] **Backshells & electrical Connectors** MIL-C-5015, 26482, 38999 I-II-III ... CAN / JN / EN, integrated in space missions Missions: Solar Orbiter, ExoMars and JUICE.
[2] **Harness and Cable assemblies,** protection and EMI/RFI shielding, for launchers with Engineering and prototyping. Missions: Engineering and prototyping of harnesses
[3] **Ground Support Systems** for Las Palomas, Villa Franca de Castillo - ESA, Grand Telescopio de Canárias, Sentinel, HispaSat, Amazonas and Ariane6.

CERTIFICATION/ S:

►UNE-EN ISO 9001 — Quality Management System.
►UNE-EN 9100 — Aerospace and Defence Requirements.
►AQAP/PECAL 2110 — Military Requirements.
►NATO CAGE — 1199B. ►IPC — A610 / A620.
►Airbus Defence and Space and Boeing certification for aeronautic harnesses manufacturing.

[1] Electrical harness assembly
[2] Production facility
[3] System assembly

EST. 1985 | Lisbon [PT] | Jose Manuel Garcia [CEO]

SINTERSA Together, we connect

CONTACT

E info@sintersa.pt
W www.sintersa.pt
T +351 912 258 756

Nuno Medeiros [Manager]
nmedeiros@sintersa.pt

WORLD PRESENCE
Lisbon [PT];
Madrid, Seville and Barcelona [ES]

INDUSTRY

TECHNOLOGY DOMAIN

- Software
- ✓ Hardware
- ✓ Services
- Other

SEGMENT

- Space Segment
- ✓ Ground Segment
- Launchers
- Downstream
- Generic

SUB DOMAIN

- › Materials and Processes
- › Structures

NON-SPACE SECTORS OF ACTIVITY

- › Energy Systems
- › Network Distribution products

Sinuta

> **Telecommunications are our passion, the world is our market, the present is our future.**

With a 25-year experience in the telecommunications sector, Sinuta is a world leader in satellite communications equipment production and has customers worldwide. Our people's competence and dedication, quality, customer service, and innovation are the main pillars that hold our leading position.

PRODUCTS/ SERVICES

[1] **DTH and VSat antenna** [TRL 9]
Development, production and worldwide supply of DTH and VSAT telecommunication solutions, including antennas and all electronic components, such as LNB's, Cable, Connectors and other accessories.

[2] **RF equipment** [TRL 4]
Development of RF equipment for Ka and Ku band front-ends.

[3] **Flat Panel Antennas** [TRL 2]
Sinuta develops new solutions for the emerging markets based on LEOs and assures that the antenna is orbit agnostic

CERTIFICATION/ S:

▶ISO 9001-2015

[1] Satellite Dishes Production
[2] Flat Panel Antennas
[3] RF Equipment

EST. 1995 | Estarreja [PT] | Diamantino Nunes [CEO]

CONTACT

E sinuta@sinuta.pt
W www.sinuta.pt
T +351 234 840 280

Ricardo Correia [Researcher]
ricardo.correia@sinuta.pt

WORLD PRESENCE
Estarreja [PT];
Rio de Janeiro [BR]

INDUSTRY

TECHNOLOGY DOMAIN

- ✓ Software
- ✓ Hardware
- ✓ Services
- Other

SEGMENT

- ✓ Space Segment
- Ground Segment
- Launchers
- Downstream
- Generic

SUB DOMAIN

- › Electromagnetic Technologies and Techniques
- › Space Debris
- › Aerothermodynamics

Space Ballistics

Citius, Altius, Ardens.

Space Ballistics is a spin-off company from the Instituto de Plasmas e Fusão Nuclear. It capitalizes on the technologies and know-how developed in the Hypersonic Plasmas Laboratory and is focused on atmospheric entry technologies, developing technological prototypes and engineering services on a lab to market basis.

PRODUCTS/ SERVICES

[1] **Computational Fluid Dynamics of [re]-entry spacecraft.**
Space Ballistics develops a suite of computational fluid dynamics and plasma radiation codes capable of predicting the aerothermal environment of a spacecraft entering a planetary atmosphere, from the rarefied to the continuum regime. These numerical tools are typically suited to Phase A/B spacecraft design [TRL 7/8]

[2] **Interferometry/reflectometry diagnostics for hypervelocity ground-test facilities and in-flight spacecraft testing.**
A prototype new-generation reflectometer is being developed based on the know-how accumulated from IPFN on fusion technologies. The compact design makes this diagnostic a good candidate for embarked measurements on small entry spacecraft, down to cubesat 3U dimensions [TRL 4/5]

[3] **Engineering services on aerothermodynamics and high-speed/high enthalpy flows.**
Based on know-how of about 20years, we provide engineering/ consultancy services for [re]-entry mission designs, high-pressure/ high-speed combustion of hydrogen-oxygen fuels, and laser-based ignition technologies.

[1] CFD & plasma radiation simulation of the Galileo Spacecraft 1995 Jupiter entry at 47km
[2] CFD simulation of a Mach 7 SCRAMJET intake
[3] Conceptual design of a reusable upper-stage with trim tabs

EST. 2020 | Lisbon [PT] | Mario Lino da Silva [CEO]

SPACE BALLISTICS

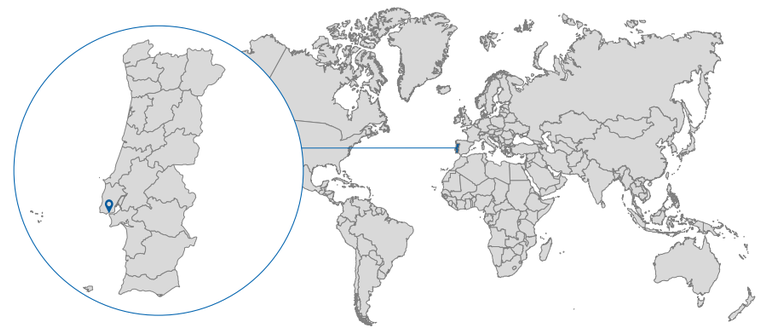
CONTACT

E esther@ipfn.ist.utl.pt
W www.spaceballistics.com
T +351 968 842 882

Mario Lino da Silva [CEO]
mlinodasilva@tecnico.ulisboa.pt

WORLD PRESENCE

Lisbon [PT]



INDUSTRY

TECHNOLOGY DOMAIN

- Software
- ✓ Hardware
- Services
- Other

SEGMENT

- ✓ Space Segment
- Ground Segment
- Launchers
- Downstream
- Generic

SUB DOMAIN

- › Space Debris
- › Structures
- › Materials and Processes

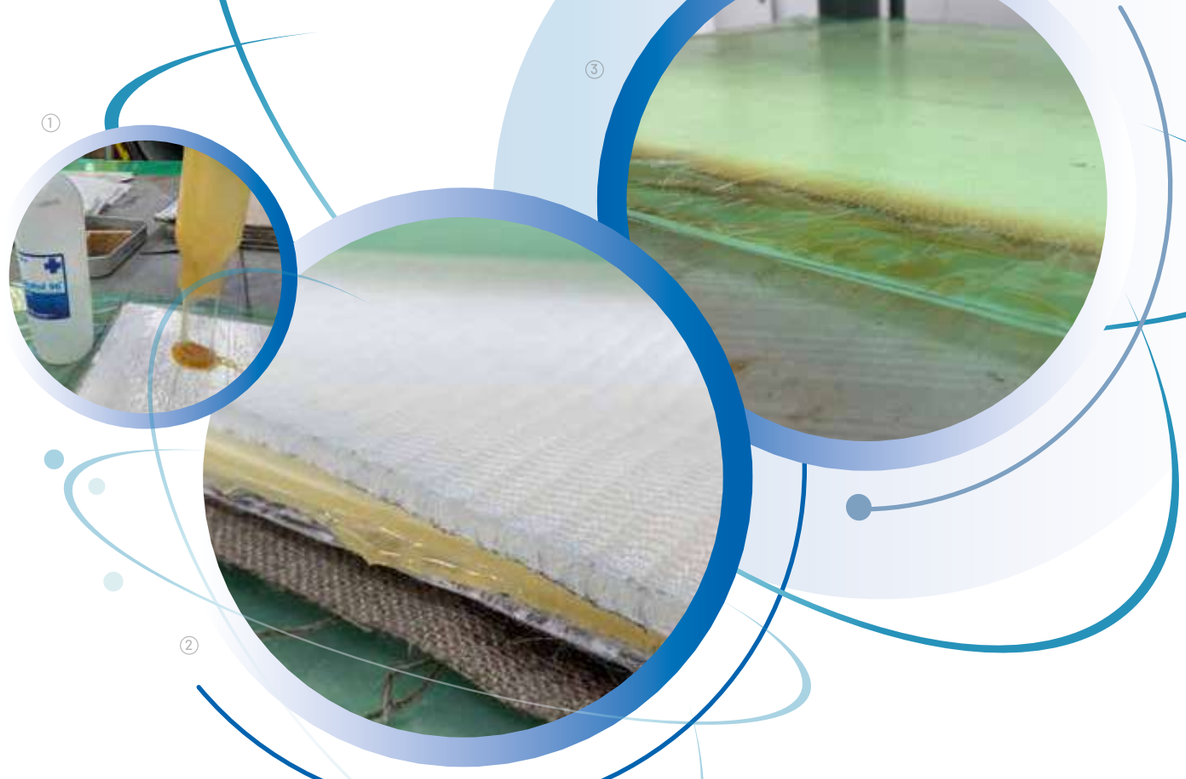
SpacEngineer

Your partner in impact protection.

Founded in 2019, SpacEngineer is a company that develops impact protective composites to absorb and dissipate high velocity impacts from foreign object damage.

PRODUCTS/ SERVICES

[1] The company's first product is called Impact2Space. It is a **composite product based on renewable materials to absorb and dissipate high-velocity impacts of foreign object damage.** In addition, impact2Space solves the structural and vibration stability problem inherent to drones' engines. This is an essential product since drones are becoming more and more prevalent in our modern world. Impact2Space is currently in development at TRL 4, and is expected to go to market at the end of 2022.



[1] Impact2Space fabric and smart material
[2] Impact2space impact composite
[3] Impact2space with the radiation protection

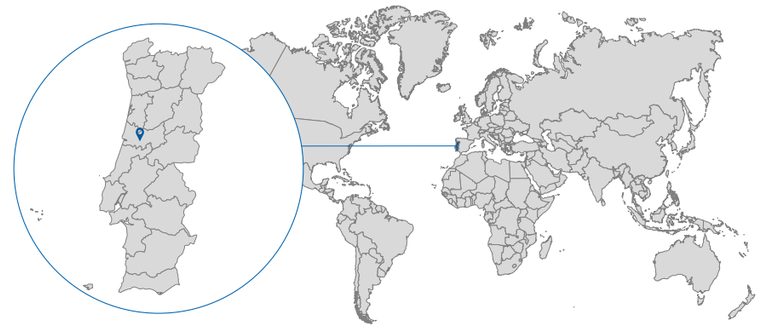
EST. 2019 Coimbra [PT] Nelson Oliveira [CEO]

CONTACT

E info@spacengineer.com
W www.spacengineer.com
T +351 914 042 361

Nelson Oliveira [CEO]
nelson.oliveira@spacengineer.com

WORLD PRESENCE
Coimbra [PT]



INDUSTRY

TECHNOLOGY DOMAIN

- ✓ Software
- Hardware
- ✓ Services
- Other

SEGMENT

- Space Segment
- Ground Segment
- Launchers
- ✓ Downstream
- Generic

SUB DOMAIN

- › Services

NON-SPACE SECTORS OF ACTIVITY

- › Environment Consultancy
- › GIS

Space Layer Technologies

Air pollution analytics.

Startup incubated at Instituto Pedro Nunes, Coimbra, since 2015, promoted by ESA-Business Incubation Center Portugal. Develops solutions based on Earth Observation for several verticals: civil protection, illegal construction, real-estate, monitoring roads, tourism and infrastructures.

PRODUCTS/ SERVICES

[1] **SOUL, Sensor Observation of Urban Life**, is an environmental platform aggregating air quality data, creating risk analysis and analytics. SOUL provides a platform that gives spatial resolution and forecast based on satellite imagery and sensors, that, combined with machine learning and downscaling algorithms, helps people to avoid environmental health threats in cities [TRL 7]

[2] **Software Services** [TRL 6]
SLTech provides design, development and implementation services for Earth Observation platforms based on Copernicus data.

[1] SOUL, Sensor Observation of Urban Life

EST. 2015 Coimbra [PT] Paulo Caridade [CEO]

CONTACT

E info@spacelayertech.com
W www.spacelayertech.com
T +351 964 469 206

Carla Gouveia-Caridade
[Head of R&D department]
gouveiacaridade@spacelayertech.com

WORLD PRESENCE
Coimbra [PT]

INDUSTRY

TECHNOLOGY DOMAIN

- Software
- ✓ Hardware
- ✓ Services
- ✓ Other

SEGMENT

- Space Segment
- ✓ Ground Segment
- Launchers
- ✓ Downstream
- Generic

SUB DOMAIN

- › System Design & Verification
- › Services
- › Other: Earth Observation and Astrodynamics

NON-SPACE SECTORS OF ACTIVITY

- › IoT
- › Education
- › Outreach
- › Communications

Spaceway

Your Way to Space.

Spaceway is focused on engineering and education solutions. As a technology company, we are at the forefront of innovation in Communications and Earth Observation. We also work to enable the next generation of space explorers and professionals through developing specialized training. We aim to bring value to businesses, communities and contribute to making the world a better place.

PRODUCTS/ SERVICES

[1] **UNIoT - Internet of Things (IoT)**
UNIoT provides UNiversal Internet of Things connectivity anywhere, anytime, affordably, and securely. The communication is based on LoRa / LoRaWAN technology allied with small satellite constellations to provide network coverage in remote locations. The devices establish a wireless interface between commercial off-the-shelf sensors and the cloud, optimizing power consumption and data transmission.

[2] **BioD'Agro - Earth Observation & IoT**
BioD'Agro is an intelligent alert and information system for decision support in AgroBiodiversity, based on sustainable farming principles. The project is focused on monitoring viticulture and biodiversity interactions in natural protected areas. It combines In-Situ and Earth Observation with artificial intelligence to help wine producers monitor the crops and empower efficient, ecological, and sustainable decisions, and environmental regulators to certify practices and control the impact in the ecosystem.

[3] **NewSpace Academy**
Spaceway takes advantage of space technology and teaches it to future explorers. In addition, we offer specialized training to space professionals. The NewSpace Academy courses are specially tailored to the space industry needs, where the attendees have the opportunity to connect and interact with distinguished experts and professionals.

[1] The NewSpace Academy offers specialized training to space professionals
[2] BioD'Agro is based on sustainable farming principles, focusing on monitoring viticulture and biodiversity interactions in natural protected areas
[3] Kitsat, a STEM satellite kit for education

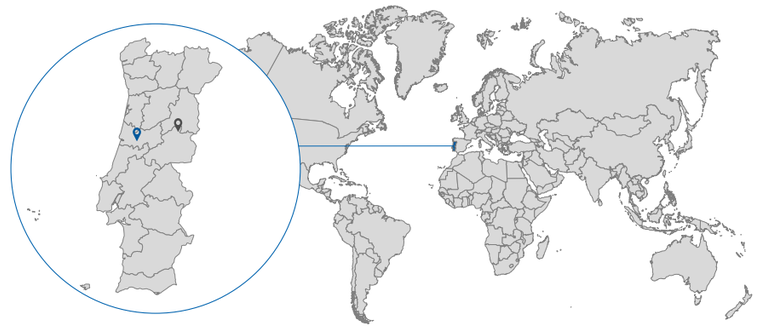
EST. 2019 · Coimbra [PT] · Jorge Monteiro [CEO]

CONTACT

E info@spaceway
W www.spaceway.pt
T +351 915 753 364

Jorge Monteiro [CEO]
jorge@spaceway.pt

WORLD PRESENCE
Coimbra, Covilhã [PT]



INDUSTRY

TECHNOLOGY DOMAIN

- ✓ Software
- ✓ Hardware
- ✓ Services
- Other

SEGMENT

- ✓ Space Segment
- Ground Segment
- Launchers
- ✓ Downstream
- Generic

SUB DOMAIN

- Space System Control
- On-Board Data Systems
- Optoelectronics

NON-SPACE SECTORS OF ACTIVITY

- Drones

Spin.Works

> **Portugal has the talent and capacity to be an important player in space.**

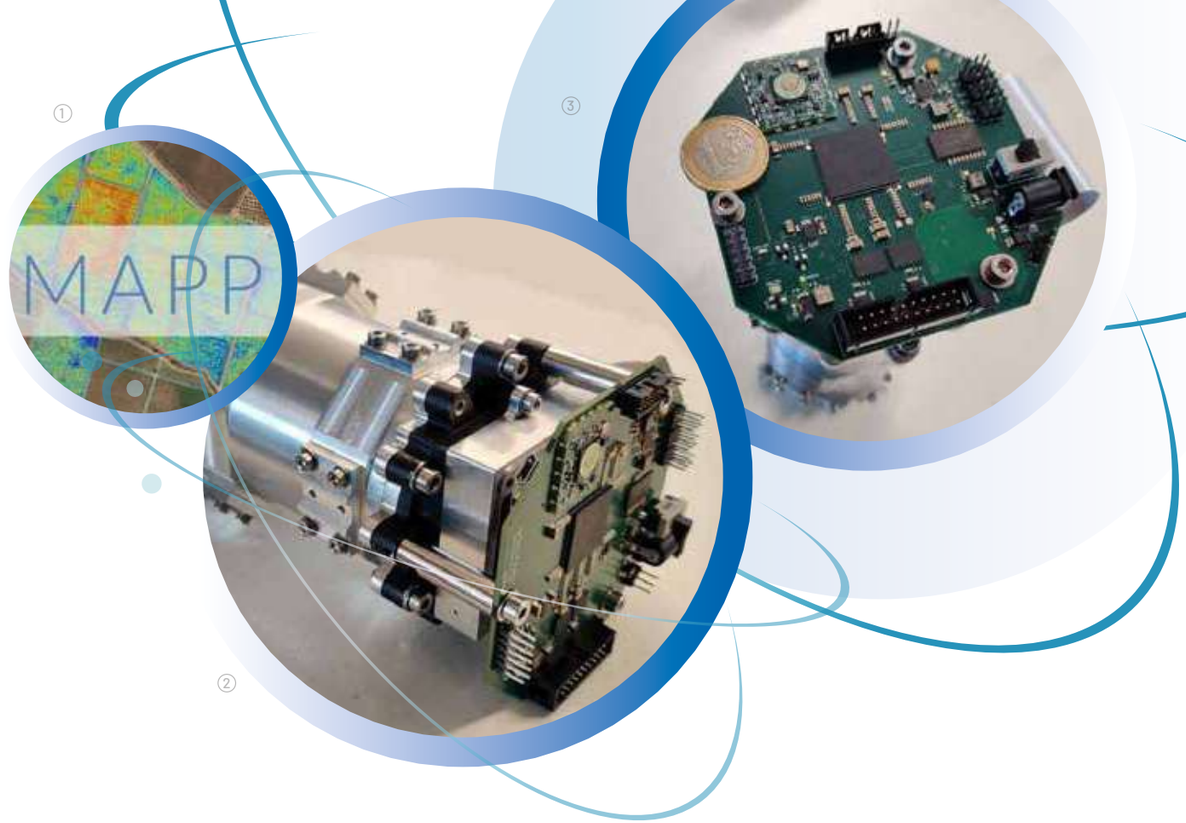
Spin.Works is an aerospace technology company established in 2006 that develops optical instruments with real-time on-board processing and classical, vision-aided and AI-based navigation & control systems for applications ranging from Earth observation to planetary missions to the Moon, Mars and small bodies, both scientific and commercial. Spin.Works also acts as a service provider in satellite and drone/UAV remote sensing applications, emphasising precision agriculture, forestry and land surveying. Spin.Works has developed and runs a global subscription-based web app available at *www.mapp.it* that uses AI, satellite and drone data to generate insights for its clients to take action without expert knowledge.

PRODUCTS/ SERVICES

[1] **Data Fusion Processor** for Terrain-Relative Navigation (TRN) and Hazard Detection and Avoidance (HDA) for Planetary Landing. Real-time implementation of hardware-accelerated TRN&HDA algorithms using hybrid [LIDAR+camera] sensors for safe and precise descent and landing for Lunar, Mars and small-body missions [TRL 6].

[2] **Miniaturized** panchromatic, thermal infrared and multi- and hyper-spectral **smart cameras for nano-satellites** in Earth Observation applications [PAN: 12MP sensor, ~4m/pixel on-ground resolution from LEO] with on-board processing capabilities [2xCPU+FPGA, TRL 8].

[3] **Drone and satellite-based earth observation service** [mapp.it] that uses multispectral data (UV, VIS, NIR and SWIR) to provide precision agriculture and forestry insights into client's properties [TRL 9].



[1] MAPP.it data services using drone & satellite data
[2] INFANTE Multispectral Camera EM
[3] Data Fusion Processor for TRN&HDA

EST. 2006 | São João da Madeira [PT] | Vasco Pimenta [CEO]

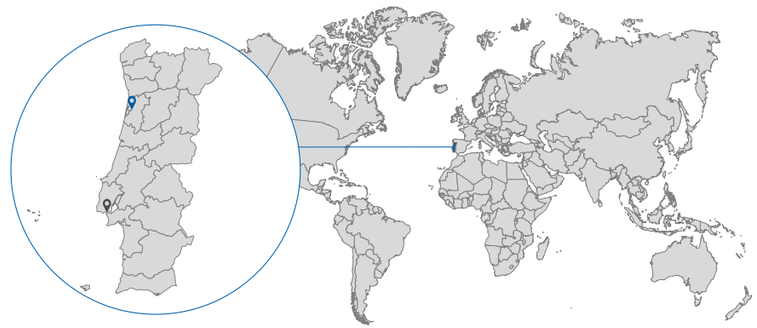
spin.works

CONTACT

E info@spinworks.pt
W www.spinworks.pt
T +351 256 001 949

Tiago Hormigo [Space Business Developer]
tiago.hormigo@spinworks.pt

WORLD PRESENCE
São João da Madeira, Lisbon [PT]



INDUSTRY

TECHNOLOGY DOMAIN

- ✓ Software
- Hardware
- ✓ Services
- Other

SEGMENT

- Space Segment
- Ground Segment
- Launchers
- ✓ Downstream
- Generic

SUB DOMAIN

- › Other: Earth Observation

NON-SPACE SECTORS OF ACTIVITY

- › Multimedia
- › Virtual & Augmented Reality Applications,
- › Geomatics
- › 3D Surveying

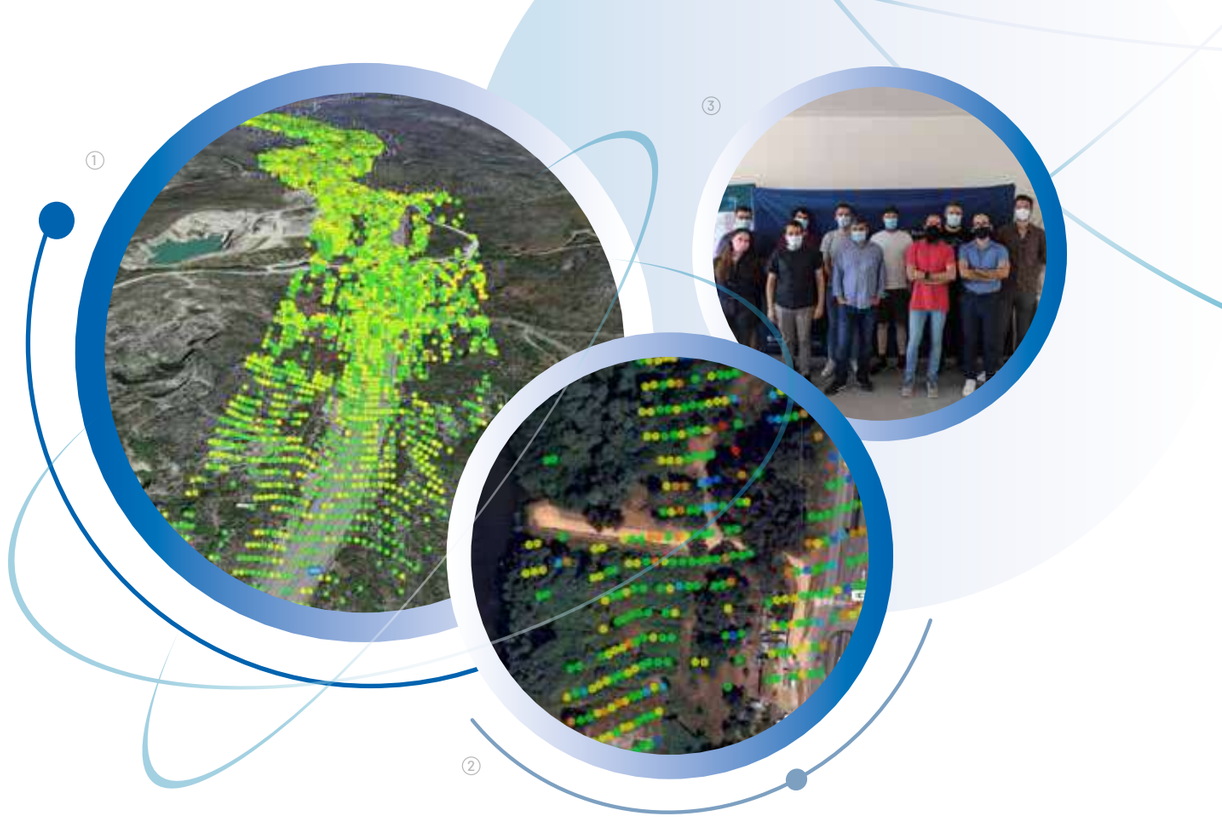
Spotlite

Spotlite monitors infrastructure from space, identifying risks before they become problems.

Spotlite is a Portuguese startup developing an infrastructure monitoring system based on remote sensing technology and Earth Observation imagery, providing analytics on a wide range of risks for structural health assessment. By continuously collecting data from orbiting satellites, Spotlite can provide global coverage and deliver actionable outputs for any world region. The data is presented in a WebGIS environment, designed to meet the specific needs of multiple industries (from transportation to mining or energy). With a continuous large-scale monitoring activity, Spotlite allows for early detection of potentially harmful events, giving operators the necessary tools to implement timely preventive measures, avoiding critical damages and losses with a continuous large-scale monitoring activity.

PRODUCTS/ SERVICES

[1] **Spotlite - large-scale infrastructure monitoring** (including ground motion, third party interference or vegetation analysis) using satellite data. [TRL 7]



[1+2] Ground motion analysis and subsidence monitoring using satellite data
[3] The team developing Spotlite

EST. 2017 | Coimbra [PT] | Ricardo Cabral; Martino Correia [CEO]

spotlite

CONTACT

E info@spotlitedata.com
W spotlitedata.com
T +351 918 234 267

Ricardo Cabral
ricardo@spotlitedata.com
Martino Correia
martino@spotlitedata.com

WORLD PRESENCE
Coimbra [PT]

INDUSTRY

TECHNOLOGY DOMAIN

- ✓ Software
- ✓ Hardware
- ✓ Services
- Other

SEGMENT

- Space Segment
- Ground Segment
- Launchers
- Downstream
- ✓ Generic

SUB DOMAIN

- › System Design & Verification
- › Structures
- › Thermal

NON-SPACE SECTORS OF ACTIVITY

- › Aeronautics
- › Energy
- › Smart Cities

STRATOSPHERE

Digital Cyberphysics.

Stratosphere builds upon the legacy of Critical Materials. A start-up, created in 2009, based on a joint vision of Critical Group and two researchers from the University of Minho / PIEP. Critical Group provided go-to-market support while the two individual founders contributed with extensive experience in advanced critical applications of materials and structures. In 2019 an MBO led by the founders of the company transformed Critical Materials S.A into Stratosphere S.A. The company maintains the same disruptive DNA and redefines its focus to become a leading Global Provider of Advanced Cyberphysical Systems.

PRODUCTS/ SERVICES

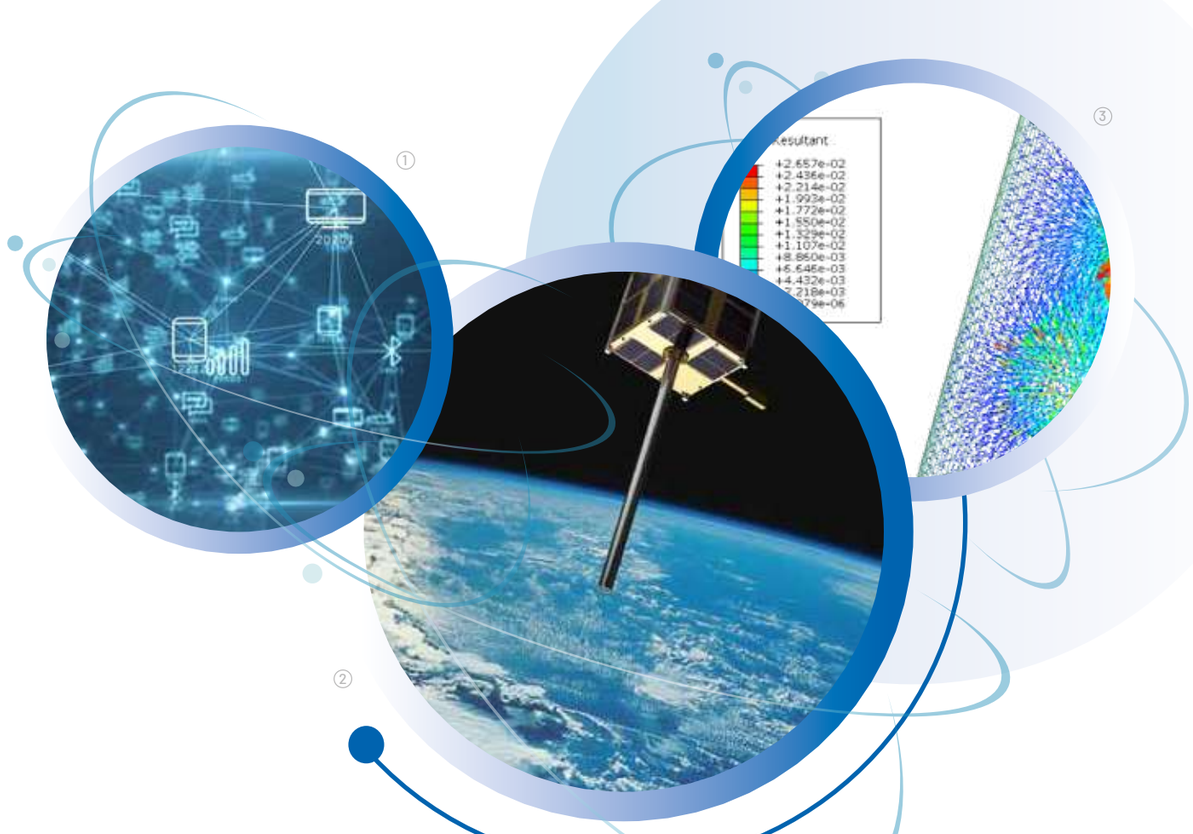
[1] **IoT and Advanced Data Analysis including edge connectivity, cloud infrastructure, cyber physics personalization** [TRL 8/9]
We act upon Edge connectivity – sensors and low-level networks; Cloud Infrastructure- scalable computation; Cyber-physics – geometry and materials multi-physical models and Personalization – data analytics tailored to your problems.

[2] **Advanced Materials Consulting** [TRL 8/9]
The company provides services with advanced knowledge capabilities in advanced materials application: material requirements Specification, material selection, and complex material Systems & Nanomaterials.

[3] **Advanced Analysis Consulting. Multiphysics Analysis** [TRL 8/9]
Based on commercial FE codes and in-house codes, we provide simulation capabilities on several multiphysical fields on fully-coupled thermomechanical analysis; thermo-electrical analysis, thermo-electrical and electro-magnetic analysis, and advanced dynamics & acoustics.

CERTIFICATION/ S:

▶ CMMIL3 / AS9100



[1] Advanced data analysis
[2] Advanced materials consulting
[3] Advanced analysis

EST. 2019 | Guimarães [PT] | Gustavo Rodrigues Dias [CEO]

Stratosphere
Digital Cyberphysics

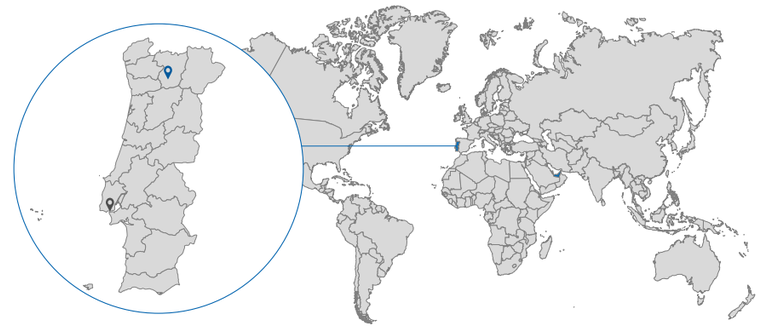
CONTACT

E info@stratosphere-tech.com
W www.stratosphere-technologies.com
T +351 253 421 032

Tuck Seng Low
[VP Cooporate Development]
tslow@stratosphere-tech.com

WORLD PRESENCE

Guimarães, Lisbon [PT]
Dubai [UAE]



INDUSTRY

TECHNOLOGY DOMAIN

- Software
- ✓ Hardware
- ✓ Services
- Other

SEGMENT

- ✓ Space Segment
- ✓ Ground Segment
- Launchers
- Downstream
- Generic

SUB DOMAIN

- › RF Systems, Payloads and Technologies
- › System Design & Verification
- › Services

NON-SPACE SECTORS OF ACTIVITY

- › Drones
- › Digital Services

TEKEVER

Pushing the boundaries in space.

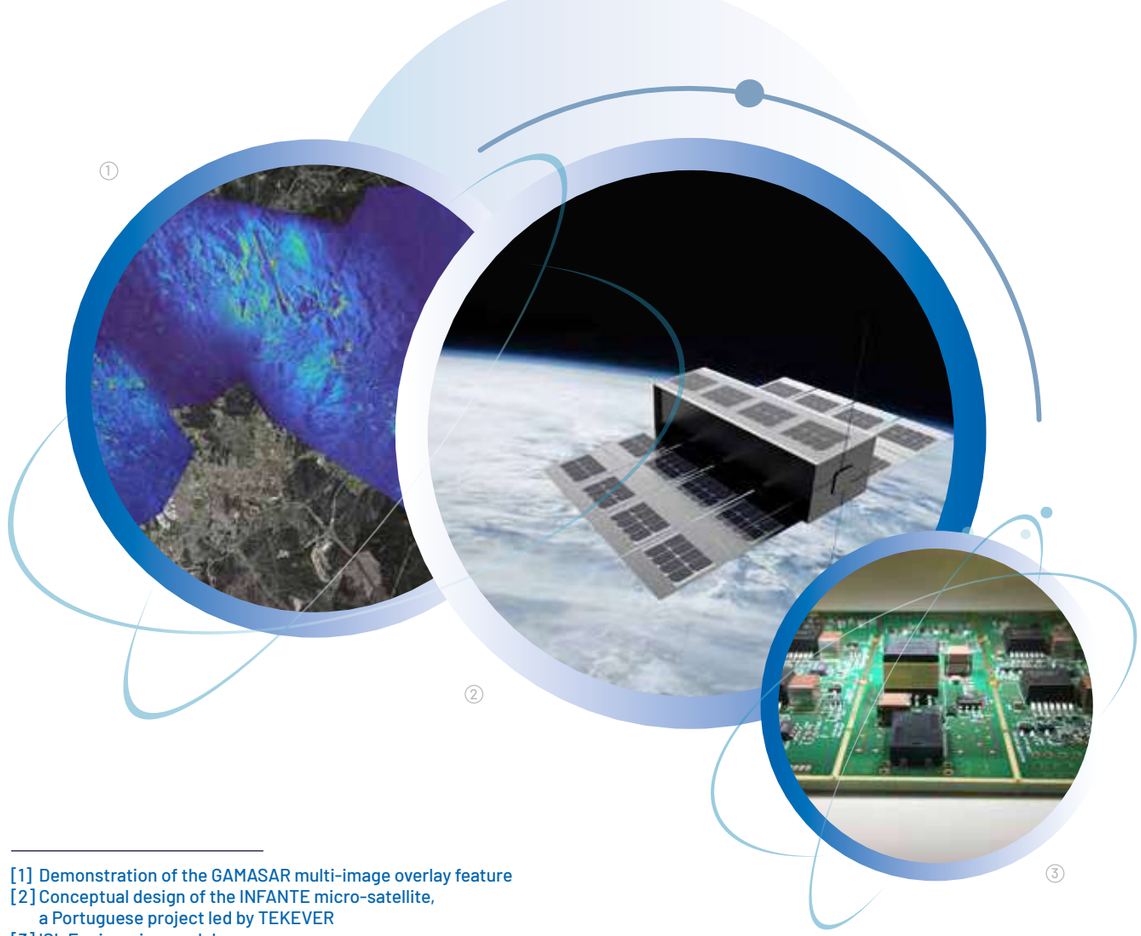
Space is playing an increasingly important role for humankind and is an integral part of our economy. From Space Exploration, Earth Observation and New Technology development, TEKEVER delivers you advanced Technology to push the boundaries in Space.

PRODUCTS/ SERVICES

[1] **GAMALINK - SDR-based communications platform** [TRL 8/9]
GAMALINK is one of the most advanced and flexible software-defined radios on the market, providing simultaneous support for ground and inter-satellite links. It has high flexibility in frequency allocation, robust RF protocol, ranging measurements embedded in the data communications and networking features. GAMALINK is the technology enabler for creating a unique communications network incorporating the Space and the ground segment.

[2] **GAMASAR - SDR-based Synthetic Aperture Radar** [TRL 6/7] [TRL 8/9]
TEKEVER Synthetic Aperture Radar technology provides cloud-penetrating and light-independent capability to capture key terrain data for security applications, resource management, environmental monitoring, etc. The flexibility of this solution allows installation in any platform of choice: either UAV or SAR-enabled satellite, providing users with low-latency data upon mission request.

[3] **Small Satellite Systems and Subsystems** [TRL 6/7]
TEKEVER works on pushing small satellites further to bring innovation, standardisation, mass reduction and quick development together into a single package. From mission analysis and systems engineering to avionics design and development, TEKEVER puts its expertise at the service of small satellite constellations for EO and Communications, targeted mainly at maritime applications.



[1] Demonstration of the GAMASAR multi-image overlay feature
[2] Conceptual design of the INFANTE micro-satellite, a Portuguese project led by TEKEVER
[3] ISL Engineering model

EST. 2001 · Caldas da Rainha [PT] · Ricardo Mendes [CEO]

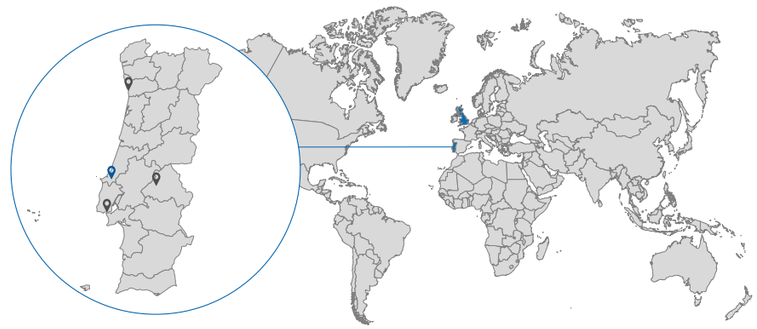
TEKEVER

CONTACT

E info@tekever.com
W www.tekever.com
T +351 213 304 300

Pedro Rodrigues
[Space Business Development Director]
pedro.rodrigues@tekever.com

WORLD PRESENCE
Caldas da Rainha, Lisbon, Porto,
Ponte de Sor [PT]; Southampton [UK]



INDUSTRY

TECHNOLOGY DOMAIN

- ✓ Software
- Hardware
- ✓ Services
- Other

SEGMENT

- Space Segment
- Ground Segment
- Launchers
- ✓ Downstream
- Generic

SUB DOMAIN

- › Services
- › Other: Software as a Service

NON-SPACE SECTORS OF ACTIVITY

- › Forestry
- › Insurance
- › Agriculture
- › Vegetation management
- › Storm water management

Tesselo

Vegetation intelligence at scale.

Tesselo makes businesses greener by using open space data analyzed with proprietary AI models. We unlock geospatial intelligence to track vegetation change, at any scale, anywhere on the planet. Tesselo creates maps, reports and graphs with actionable insight that are sold globally on three main markets: Forest, Utilities, Carbon stakeholders. Our solutions help our customers optimize their operations and better protect their green assets. Tesselo was awarded four grants from the European Space Agency and the European Commission since its inception.

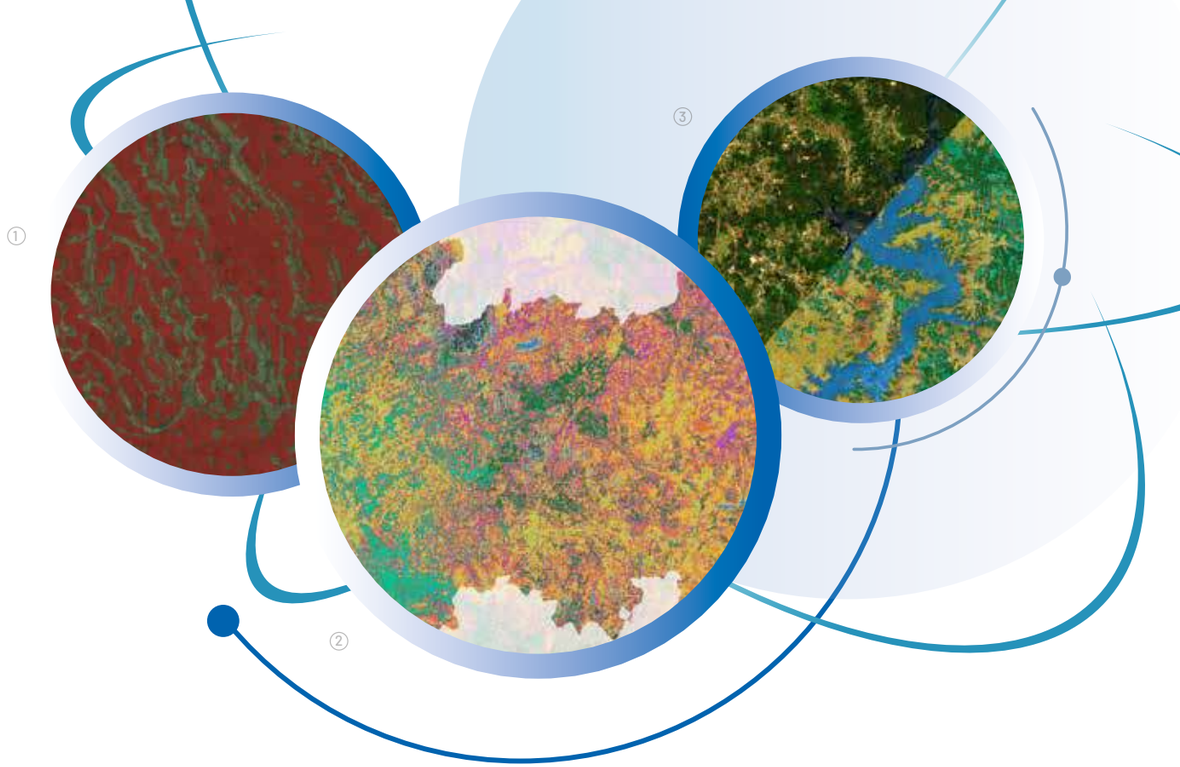
PRODUCTS/ SERVICES

Our land and vegetation monitoring services are deployed continuously at any geographical scale, anywhere on the planet. We combine all types of open Earth Observation sensors to turn low-resolution, low-frequency data into high-resolution, high-frequency insight.

[1] **FORESTRY**
- Forest inventory
- Precision forestry
- Forest fire insurance

[2] **UTILITIES**
- Vegetation management

[3] **CARBON ACCOUNTING**
- Land use & land cover
- Afforestation/reforestation suitability
- Carbon inventory



[1] Indonesia, mangrove mapping for carbon storage estimation, 1m resolution
[2] Portugal, land use map for forest inventory, 12 classes, 10m resolution
[3] Tesselo Tree Classification over satellite imagery - Portugal 2020

EST. 2017 | Lisbon [PT] | Rémi Charpentier [CEO]

TESSELO

CONTACT

E hello@tesselo.com
W www.tesselo.com
T +351 215 812 855

Marine Utgé-Royo
[Chief Sustainability Officer]
marine@tesselo.com

WORLD PRESENCE
Lisbon [PT]

INDUSTRY

TECHNOLOGY DOMAIN

- ✓ Software
- Hardware
- Services
- Other

SEGMENT

- Space Segment
- Ground Segment
- Launchers
- ✓ Downstream
- Generic

SUB DOMAIN

- Space System Software
- Services

NON-SPACE SECTORS OF ACTIVITY

- Telecommunications
- Future Internet
- Smart Cities

Ubiwhere

Suiting the Future.

Founded in 2007, Ubiwhere is focused on Research, Development and Innovation of software-based solutions in the areas of Smart Cities, Telecom and Future Internet, and New Technologies. As an innovative and technological company, the skills of our team are one of our differentiating factors. Being one of the pillars of the company's success, our team is prepared to face the utmost challenges on the market. Ubiwhere cooperates with leading technology companies which value our partnership and recognise Ubiwhere's large-scale contribution to their creative and innovative projects. We have the innate desire of changing the world, and that's why we create, design and develop solutions to improve everyone's lives.

PRODUCTS/ SERVICES

[1] **Integrated Network Management and Orchestration:** Mobile Network Operators [MNO] management systems adaptation to control satcoms' radio resources and service [TRL 5]

[2] **Virtualisation of satcom network function**s to ensure compatibility with the 5G Software-Defined Networking [SDN] and Network Functions Virtualisation [NFV] architecture [TRL 6]

CERTIFICATION/ S:

▶CMMI-DEV L3 ▶CMMI-SRV L3
▶ISO 9001 ▶NP 4457 ▶NP 4469

[1] The Urban Platform, created by Ubiwhere aims to enable efficient territory management, was nominated as "Best Digital Solution in Portugal" by WSA 2021
[2] The Urban Platform control room
[3] Ubiwhere headquarters in Aveiro

EST. 2007 Aveiro [PT] Rui A. Costa [CEO]

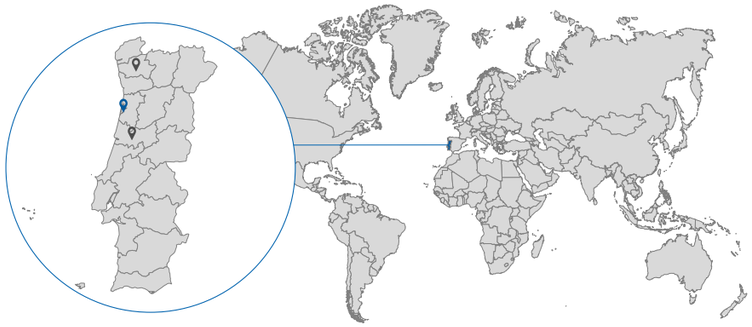
ubiwhere
SUITING THE FUTURE

CONTACT

E hello@ubiwhere.com
W www.ubiwhere.com
T +351 234 484 466

Rui A. Costa [Co-CEO]
rcosta@ubiwhere.com

WORLD PRESENCE
Aveiro, Coimbra, Guimarães [PT]



INDUSTRY

TECHNOLOGY DOMAIN

- ✓ Software
- Hardware
- Services
- Other

SEGMENT

- ✓ Space Segment
- Ground Segment
- Launchers
- Downstream
- Generic

SUB DOMAIN

- › Space System Software
- › System Design & Verification
- › Automation, Telepresence & Robotics

NON-SPACE SECTORS OF ACTIVITY

- › Software development

Valispace

The Single Source of Truth for your Engineering Data.

Valispace is for companies that develop complex hardware that are trying to accelerate product development – but are struggling to manage and control the compound complexity of modern product development projects, resulting in project drag. Valispace is a productivity tool for development teams that's specifically made to deal with the complex nature of Dynamic Engineering Data – which is central to the progress of any hardware project. Unlike document-based tools, which cannot supply accurate, up-to-date values, Valispace is a central, data-based single source of truth that connects everyone involved in the concept-to-test phase of hardware development and supplies them with reliable, collaboration-ready data. This makes Valispace a key catalyst for faster, higher-quality, and less costly innovation.

PRODUCTS/ SERVICES

[1] **Software:**
Valispace develops a browser-based software allowing engineers to collaboratively develop better complex hardware products, including rockets and satellites. It serves as a Single Source of Truth and will enable engineers to store and collaborate along the engineering life-cycle, all the way from requirements, through detailed design up to verification and testing.

[1] The Valispace leadership team: Marco, Louise and Nelson
[2] The components module in Valispace
[3] Requirements tracing in Valispace

EST. 2016 | Lisbon [PT] | Marco Witzmann [CEO]

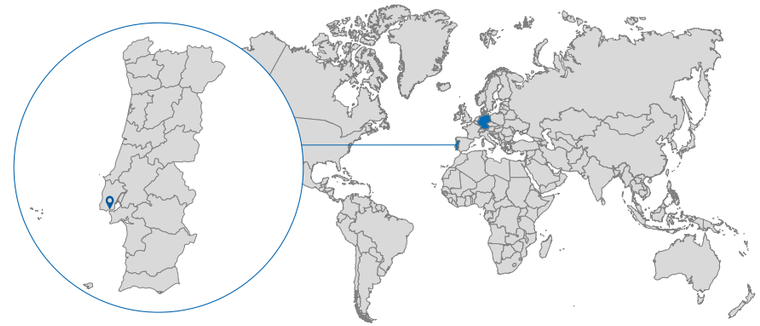
VALISPACE

CONTACT

E contact-us@valispace.com
W www.valispace.com
T +351 964 211 963

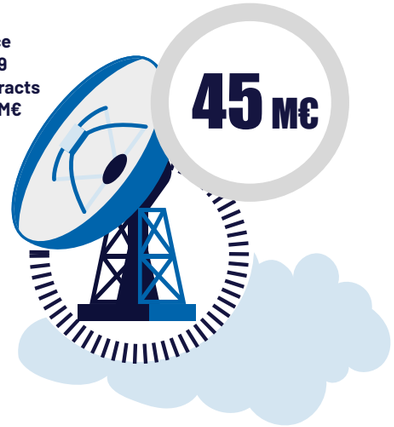
Louise Lindblad [Co-founder and COO]
louise@valispace.com

WORLD PRESENCE
Lisbon [PT];
Bremen [DE]

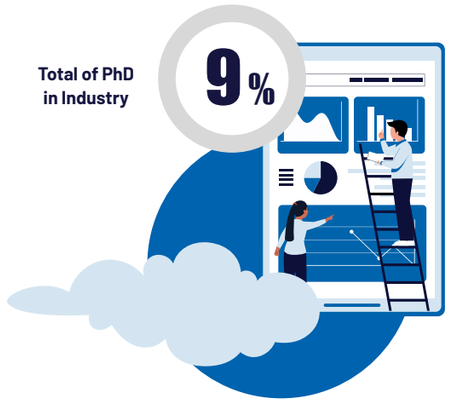


INDUSTRY INDICATORS *

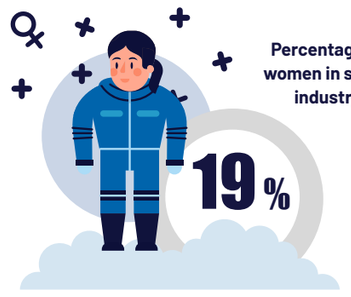
Turnover Space Activities 2019 (ESA related contracts represent 18-19M€ of the total)



Total of PhD in Industry

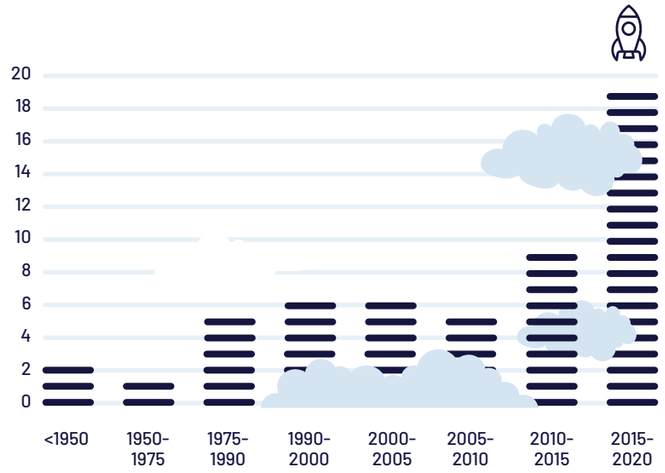


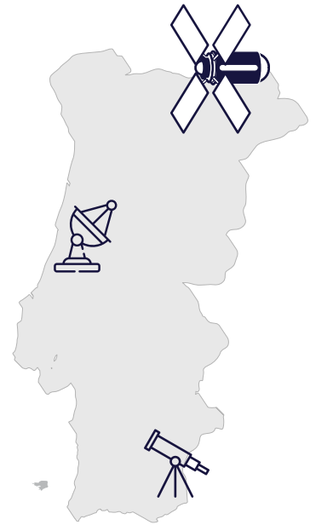
Industry employees working in space, including downstream



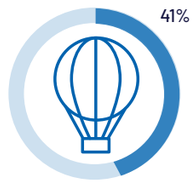
Percentage of women in space industry

NEW SPACE COMPANIES IN PORTUGAL



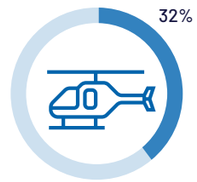


COMPANY SIZES*



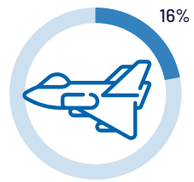
MICRO

1-9 employees



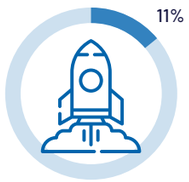
SMALL

10-49 employees



MEDIUM

50-249 employees



LARGE

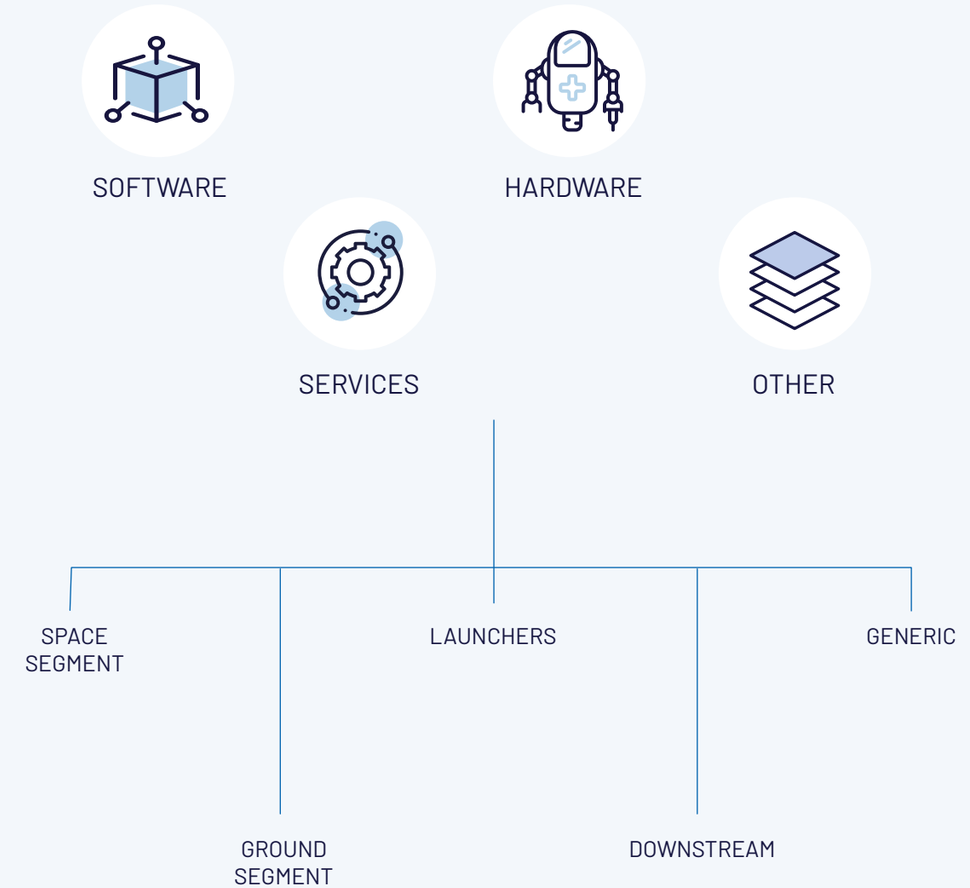
250**+ employees

* Information from the year 2019.
** Mainly companies whose core market is non-space.

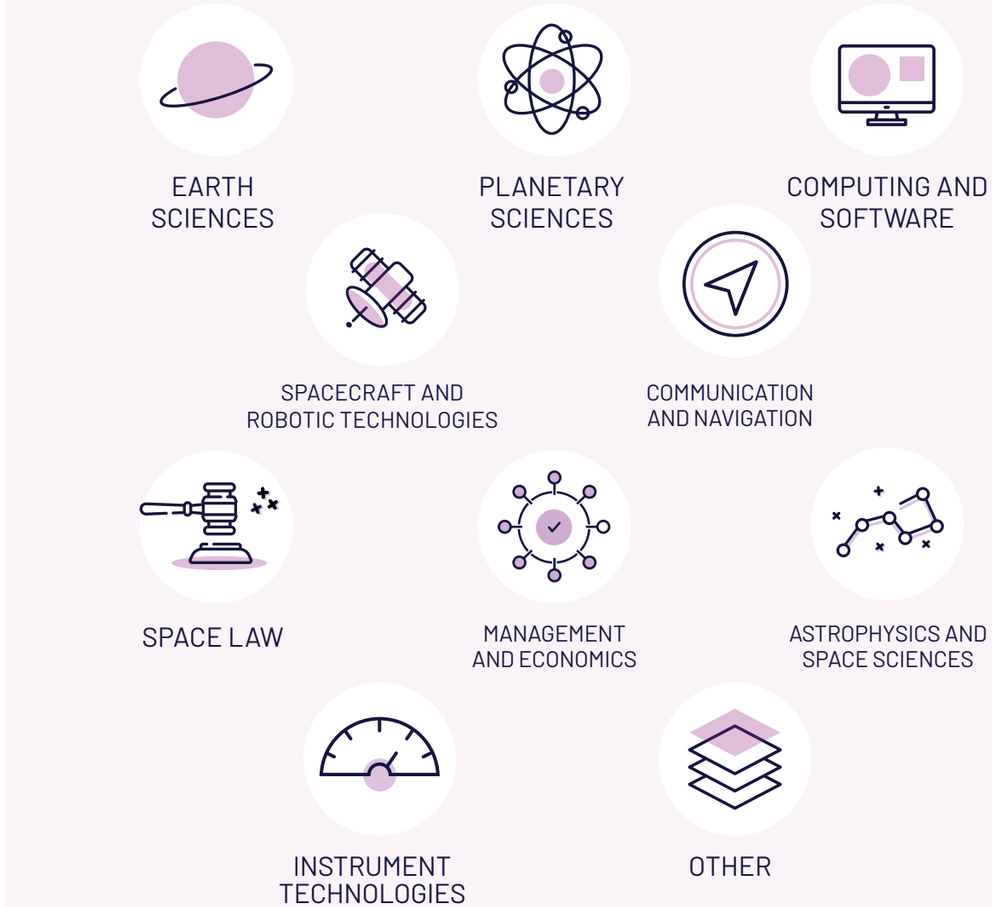
RESEARCH AND INNOVATION CENTRES

PAGE 158 – 225

OVERVIEW OF ALL INDUSTRY SEGMENTS



OVERVIEW OF ALL RESEARCH SEGMENTS



INDEX RESEARCH CENTRES

RESEARCH DOMAIN

- Spacecraft and Robotic Technologies
- Communication and Navigation
- Space Law

NON-SPACE SECTORS OF ACTIVITY

- Aircraft Technologies
- Airworthiness & Spaceworthiness
- Education
- Air & Space Risk Assessment and Mitigation in Launch Operations
- Safety Management System (SMS) Implementation

CERTIFICATIONS

- EASA PT-DTO-004

AeroEspaço

Fly with Science.

AeroEspaço/ACTV Science Center is a non-profit organization, created in 2013 with the main purpose of promotion and dissemination of the scientific and technological culture in the areas of Air and Space, as well as, implementing and participating in the realization of Research and Technological Development [I&DT] projects. Main activities include: Cooperation and R&D projects in Aeronautics and Aerospace. In addition, Aerospace has a 4-seat aircraft and a Two Seater Glider for experiments, including microgravity or launching payloads. AeroEspaço also owns several HPR Rockets for payloads experiments and operates Unmanned Advanced Aerial Platforms (Fixed Wing VTOL) for dedicated Payloads or Inflight Payloads Retrieves.

PRODUCTS/ SERVICES

[1] **CARAVELA**
It is an R&D project that proposes the design, develop ment and demonstration of technologies for building blocks for a multi-use microlauncher dedicated to small satellites.

[2] **CANSAT**
AeroEspaço was a pioneer at a national level in the development and comprehensive dissemination of aerospace culture in Portugal, as it was the entity that implemented and developed in Portugal the CANSAT program. Furthermore, at the international level AeroEspaço was selected by the European Space Agency to organise for the first time in Portugal two consecutive ESA Cansat Europe Finals.

[3] **FIREFRONT**
R&D project that is developing a solution to support firefighting actions in forest fires through the real-time detection and tracking of fire fronts and reburns using manned and unmanned aerial vehicles.

[1] High Power Rocket preapared for launch scientific payload
[2] Boarding of passengers in AeroEspaço aircraft to perform a scientific mission
[3] Unmanned Fixed Wing VTOL-OGASSA

EST. 2013

João Carlos Francisco
[Director/ Coordinator]

Santa Cruz [PT]

CONTACT

E actv@actv.pt
W www.actv.pt
T +351 969 825 812

João Carlos Francisco
joao.francisco@actv.pt

RESEARCH DOMAIN

- Spacecraft and Robotic Technologies

AFFILIATION

- University of Beira Interior

NON-SPACE SECTORS OF ACTIVITY

- Aerodynamics and Propulsion
- Aircraft Systems
- Air Transport
- Aeronautics

AEROG-LAETA Associate Lab, at UBI – University of Beira Interior

Developing Technology.

The Aeronautics and Astronautics Research Center [AEROG] is dedicated to the research and technology development in the field of Aeronautics and Space, with a view to improving safety and environmental protection, while promoting the socio-economic growth and the quality of life of citizens. The activities of the AEROG aim at contributing to strengthen the excellence of European science base in the scientific and technological fields of aeronautics and astronautics. AEROG is a member of the National Associated Laboratory LAETA.

PRODUCTS/ SERVICES

[1] **Nonlinear Adaptive Filtering for Aerospace Systems.**

[2] **Attitude Motion, Passive and Semi-Passive Stabilization Systems of Satellites.**

[3] **Optimization of fuel injection into the combustion chamber of liquid propelled rocket engines for increased efficieny and reduced operational costs.**

[1] Rocket Engine
[2] Satellite

AEROG
Aeronautics and Astronautics Research Center

EST. 2007

André R. Silva
[Director/ Coordinator]

Covilhã [PT]

CONTACT

E aerog.laeta@gmail.com
W www.aerog.pt
T +351 275 329 712

Jorge M. Barata
jbarata.laeta@gmail.com

RESEARCH DOMAIN

- Earth Sciences
- Planetary Sciences
- Computing and Software

NON-SPACE SECTORS OF ACTIVITY

- Ocean
- Coastal
- Plastic detection

AIR Centre

Earth Observation: Space Technologies for the Blue Economy.

The AIR Centre is an internationally networked organisation that fosters job creation and knowledge-driven sustainable economic development in Atlantic regions. It addresses and integrates space, climate, earth, ocean, energy and data sciences and promotes cooperation in alignment with national/regional priorities and global challenges.

PRODUCTS/ SERVICES

[1] **Early Warning System for the Risk of Sporulation of Pithomyces Chartarum**
Employing satellite remote observation and in situ sensors to develop a system consisting of an early pilot with a geographical map, of public access, with information on the state of pasture vegetation. Supports farmers to prevent the contamination with the fungus *Pithomyces chartarum*, mitigating associated impact on the local economy.

[2] **PORTS XXI**
Space Enabled Sustainable Port Services. The goal is to design and evaluate the feasibility of the deployment of a transformative environmental monitoring and management service, moving towards zero pollution ports, using a user-driven, requirements based, approach, covering water and air quality, using EO, meteo, oceanographic and CCTV data sources.

[3] **LABPLAS**
Understanding the sources, transport, distribution and impacts of plastic pollution in all environmental compartments. Seventeen partners from 8 countries will apply technological advances, promote biodegradable novel materials, develop innovative and up-scalable models (for assessing the fate, effects and risks of plastics), and present results to national and international authorities and industry for decision making.

[1] Pilot public website with in situ sensors and alert sectors
[2] Spectrometer for MarineLitter, Flight tests with drones
[3] Spectrometer for MarineLitter, Waterfall, image of the detection of the spectrum of marine litter in the infrared field

AIR CENTRE
ATLANTIC INTERNATIONAL RESEARCH CENTRE

EST. 2018

Miguel Belló [CEO]
Emir Sirage [COO]

Terceira - Azores,
Lisbon [PT]

CONTACT

E info@aircentre.org
W www.aircentre.org
T +351 217 231 062

Pedro Silva
pedro.silva@aircentre.org

RESEARCH CENTRES

RESEARCH DOMAIN

- Astrophysics and Space Sciences
- Spacecraft and Robotic Technologies
- Instrument Technologies

AFFILIATION

- Faculty of Engineering of the University of Beira Interior

NON-SPACE SECTORS OF ACTIVITY

- Energy
- Fluid mechanic
- Aeronautics

C-MAST, at UBI – University of Beira Interior

Leading research activities in astrodynamics and propulsion systems.

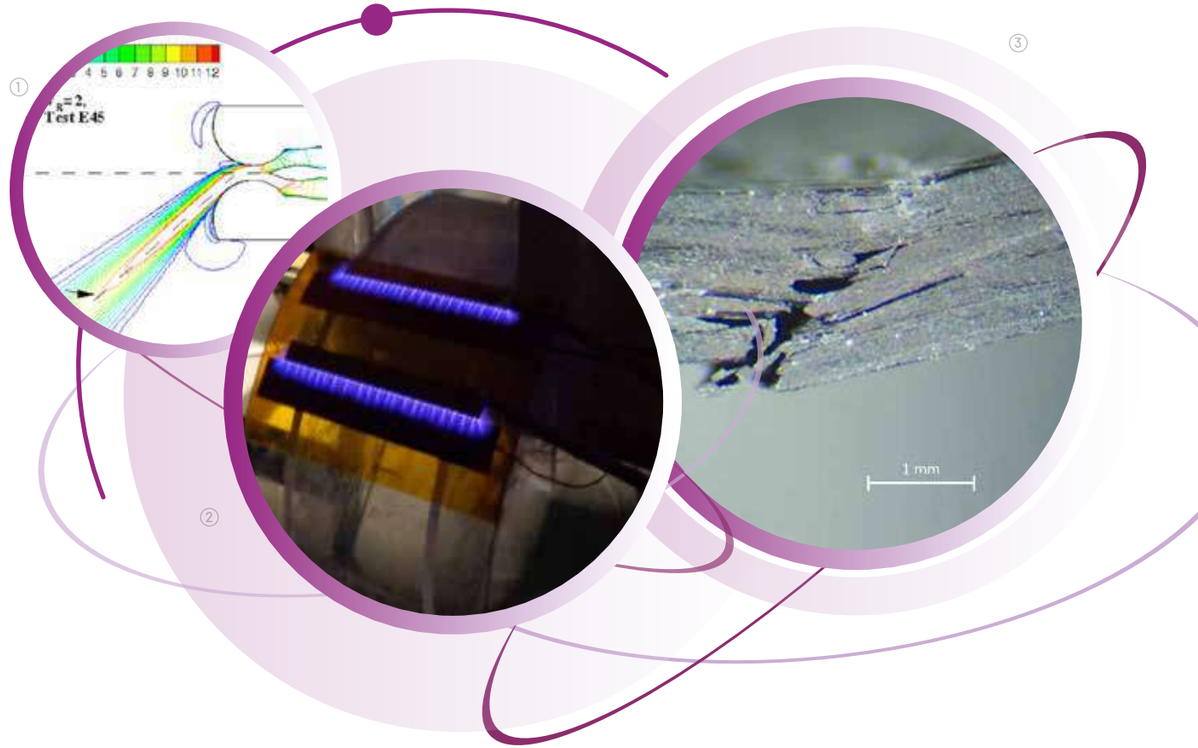
C-MAST specific objectives are to carry-out high-level focused research, promote international research collaboration, improve the national and EU macro-regional development, train researchers in ambitious MSc, PhD and Post-Doc programs, using fully funded research contracts to promote scientific employment and promote the scientific culture with outreach activities. C-MAST has been actively co-organizing events with the IAF [International Astronautical Federation]. The Centre is an active member of International Research Networks [e.g. EASN, and CYTED].

PRODUCTS/ SERVICES

[1] **Fundamental studies of system dynamics** in space environment and development of spacecraft attitude and orbital control systems, space missions, single spacecraft, large space structures, or distributed systems for space exploration, such as formation flying satellites.

[2] **MAGAL Constellation** - Setting the cornerstone of a future ocean and climate change monitoring constellation, based on radar altimeter data combined with gravity and ocean temperature and salinity measurements.

[3] **Consulting and large-scale industry-related projects.**



[1+2] Plasma actuator system, incorporated in the Coanda nozzle, for aerospace propulsion system [developed within the scope of the European Project ACHEON]
[3] Composites, structures and nanotechnologies

C-MAST

EST. 1994

Paulo Jorge dos Santos Pimentel de Oliveira [Director/ Coordinator]

Covilhã [PT]

CONTACT

W www.aerospace.ubi.pt
T +351 275 329 906

Paulo Oliveira
pipo@ubi.pt

RESEARCH CENTRES

RESEARCH DOMAIN

- Earth Sciences
- Other: Radiation Protection and Safety, Dosimetry and Radiobiology
- Other: Advanced Material

AFFILIATION

- Instituto Superior Técnico of the University of Lisbon

NON-SPACE SECTORS OF ACTIVITY

- Radiopharmaceutical sciences
- Cultural heritage

C2TN,
at Instituto Superior Técnico of the University of Lisbon

Radiation for Science and Society.

C2TN is a major National and International player in scientific and technological areas related to the Nuclear Sciences and Technologies and applications of Ionizing Radiation. Its motto, "Radiation for Science and Society", entails the need to deliver scientific excellence and contribute to the solution of societal challenges in its areas of competence, namely Life and Health Sciences, Radiation Protection, Earth Sciences, Environment, Cultural Heritage and Materials Sciences. C2TN is an interdisciplinary centre of excellence engaged in R&I, development, services and advanced training.

PRODUCTS/ SERVICES

[1] **Gamma irradiation**
C2TN operates cobalt-60 gamma irradiators, providing gamma irradiation services under different environments to objects as small as electronic components

[2] **Radiation analysis and effects**
C2TN provides radiation shielding studies and irradiation simulations and modelling, in support of activities related to environmental exposures

[3] **Education and training**
C2TN provides education and training in its areas of competence and expertise, like on the effects of ionizing radiations, radiation protection and safety or cryogenics and refrigeration

[1] Radiation Protection and Dosimetry - exposure of individuals and systems to ionizing radiation
[2] Life and Health Sciences - applications and effects of ionizing radiation
[3] Earth Systems and Environment

C2TN

EST. 2013

António Pereira Gonçalves
[Director/ Coordinator]

Lisbon [PT]

CONTACT

E outreach.c2tn@ctn.tecnico.ulisboa.pt
W http://c2tn.tecnico.ulisboa.pt
T +351 219 946 183

António Pereira Gonçalves
apg@ctn.tecnico.ulisboa.pt

RESEARCH DOMAIN

- Earth Sciences
- Planetary Sciences

NON-SPACE SECTORS OF ACTIVITY

- Geosciences
- Geology
- Marine Geology
- Geochemistry
- Geophysics
- Seismology
- Rock physics and Geomechanics
- Geomagnetism
- Paleomagnetism
- Georesources and Geoenvironment
- Permafrost monitoring
- Natural and Anthropogenic risks
- Modelling and Computation

C4G – Collaboratory for Geosciences

C4G, resources in geosciences for the community.

C4G is a distributed research infrastructure of the Portuguese Roadmap dedicated to Solid Earth Sciences. Its objective is to gather and make available scientific resources thus, promoting the creation and diffusion of scientific knowledge in Portugal. C4G is the Portuguese counterpart of EPOS-ERIC [European Plate Observing System]. C4G is based on collaborative and organized sharing of knowledge, technology and training resources between research units and laboratories, higher education institutions, government agencies, the private sector, civil society and citizenship. The set of resources comprises data, products, services and scientific equipment representing the best installed capacity in Portugal.

PRODUCTS/ SERVICES

In C4G there are three groups working on Space-related topics: Geodesy, Remote Sensing and Cosmic Hazards.

[1] **Dissemination of GNSS Data**
GNSS data from ReNEP, the portuguese Network of Permanent GNSS Stations and the EPOS-GNSS Products European Portal.

[2] **Solar data and monitoring of space climate data**
Solar data. Monitoring parameters of space meteorology. Calculation of astronomical ephemeris. Asteroid catalogue. Space Weather. Asteroid reflectance spectroscopy. Risk of asteroid-Earth collisions.

[3] **mapRS**
Mapping for geo-resource management, environment and geohazards emergency situations derived from multi-source remote sensing data.

[1+2] Mission to Support Monitoring the Cumbre Vieja Volcano, La Palma / Spain, 2021
[3] Installation of Monitoring Equipment in the Azores Archipelago / Portugal, 2021

C4G
Collaboratory for Geosciences
Colaboratório para Geociências

EST. 2013

Rui Manuel da Silva Fernandes [Director/ Coordinator]

Covilhã [PT] + 15 distributed national institutions

CONTACT

E contacto@c4g-pt.eu
W www.c4g-pt.eu
T +351 275 319 700

Helena Ribeiro; Lídia Quental; Teresa Seixas;
hribeiro@dgterritorio.pt; lidia.quental@lneg.pt; tmseixas@fc.up.pt

ESA's Artemis communications satellite © ESA

RESEARCH CENTRES

RESEARCH DOMAIN

- Earth Sciences
- Astrophysics and Space Sciences
- Computing and Software

AFFILIATION

- Uninova - Institute for the Research of New Technologies

NON-SPACE SECTORS OF ACTIVITY

- Biomedical Research
- Image Processing
- Artificial Intelligence
- Data analysis

CA3 at UNINOVA – Nova University of Lisbon

Our main mission is to actively participate in applied research projects, by defining new concepts, methods and algorithms capable of solving real-world problems.

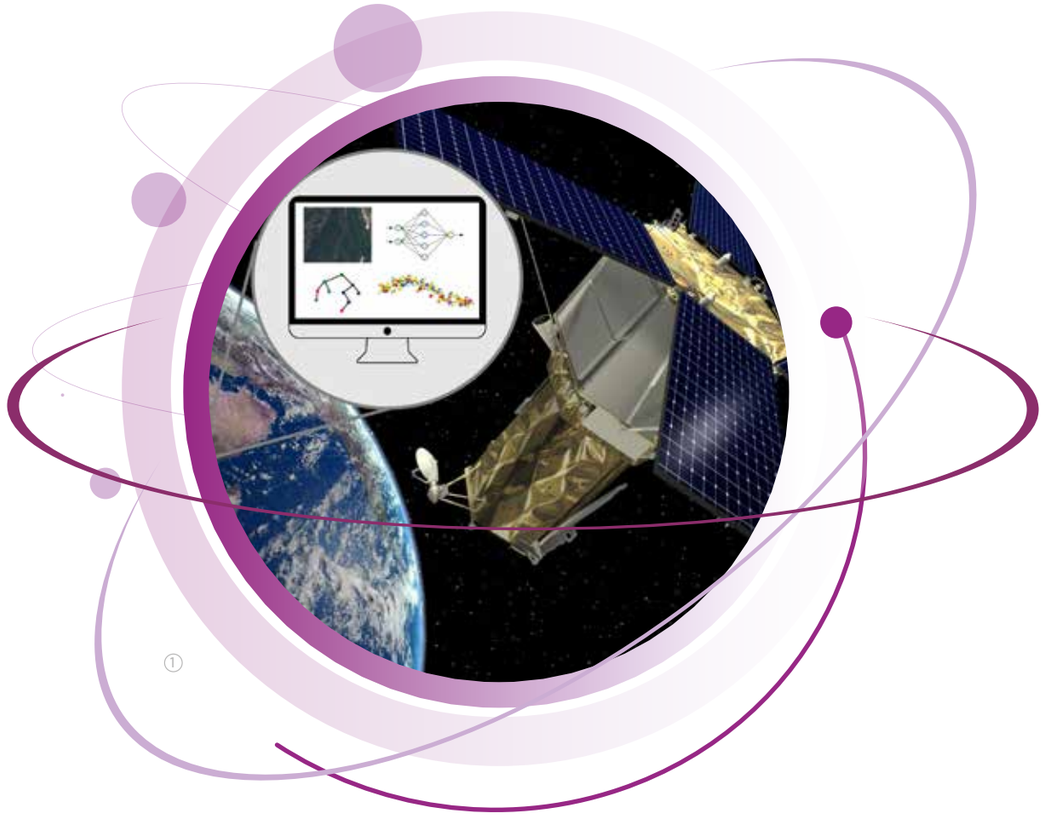
The Computational Intelligence Research Group [CA3] was formed in 1996 and in 2000 it was integrated in the Centre of Technologies and Systems [CTS] of Uninova. The CA3 group joins researchers with interests in Computational Intelligence, Intelligent Decision Systems and Intelligent Image Processing. We already have 23 projects financed by ESA and three undergoing projects with FCT. Our application projects are focused on: Aero-Space, Biomedicine and Environment.

PRODUCTS/ SERVICES

[1] **IPSTERS - IPSentinel Terrestrial Enhanced Recognition System**
Advances in the generation of land occupancy maps using active learning and Fuzzy Data Fusion. [TRL 3]

[2] **FUELMON - Remote Fuel Break Monitoring for Forest Fire Protection**
Monitoring of Fuelbreaks for detection of maintenance operations and assess biomass accumulation. [TRL 3]

[3] **MUSEP - MUlti-mission Science Exploitation Platform**
Development of a SEPP (Multi-Mission Science Exploitation and Preservation Platform) system, capable of supporting the exploitation and preservation of multi-mission scientific data and products. [TRL 6]



[1] Advanced image analysis for Earth Observation

CA3 Computational Intelligence Research Group

EST. 1996

José Manuel Fonseca
[Director/ Coordinator]

Monte da Caparica [PT]

CONTACT

E atm@uninova.pt
W www.ca3-uninova.org
T +351 212 949 625

André Damas Mora
atm@uninova.pt

RESEARCH DOMAIN

Earth Sciences

AFFILIATION

- IGOT - Institute of Geography and Spatial Planning, University of Lisbon

NON-SPACE SECTORS OF ACTIVITY

- Physical and Human geography
- Climate Change and Environmental Systems
- Environmental Hazard and Risk Assessment and Management
- Migration, Space and Societies
- Modelling, Urban and Regional Planning
- Tourism, Heritage and Space
- Urban and Regional Change and Policies

CEG, at IGOT of the University of Lisbon

In the frontiers of geographical research.

The Centre of Geographical Studies is a R&D unit of the Institute of Geography and Spatial Planning at the University of Lisbon. Founded in 1943, the CEG is the main reference in the research and dissemination of geographical knowledge in Portugal and a high prestige unit at the international level. The mission of the CEG is to develop geographical research, promote and disseminate geographical knowledge, contribute to societal and regional development, spatial planning, sustainable use of environmental resources and spatial justice.

PRODUCTS/ SERVICES

[1] **High-resolution and landcover mapping and change analysis**
CEG provides high quality mapping and monitoring services across the globe, with experience in Europe, Africa, North and South America, the Arctic and Antarctica.

[2] **Inland water monitoring**
Remote sensing monitoring of water quality in inland waters, including lakes, dams and rivers.

[3] **Ground truthing data in complex and remote environments**
Support to satellite data and products validation through ground truthing in remote environments, including DEMs, LiDAR, multispectral data, coastal erosion, mass movements, snow cover, vegetation, wildfires and infrastructure mapping. Experience with ESA, EC and several national programmes and projects.

[1] Measuring water physicochemical properties for ground truthing Sentinel-2 and UAV multispectral imagery [National Park Tursujuq, Nunavik, Canada]
[2] Surveying fast degrading permafrost coasts [Yukon, Canada]
[3] Surveying late lying snow patches for ground truthing microwave satellite imagery [King George Island, Antarctic]

CEG
Centro de Estudos Geográficos

EST. 1943

José Luis Zêzere
[Director/ Coordinator]

Lisbon [PT]

CONTACT

E ceg@campus.ul.pt
W www.ceg.ulisboa.pt
T +351 210 443 000

Gonçalo Vieira
vieira@igot.ulisboa.pt

RESEARCH DOMAIN

- Spacecraft and Robotic Technologies
- Computing and Software

NON-SPACE SECTORS OF ACTIVITY

- Ocean
- Aeronautics
- Automotive
- Urban Mobility

CERTIFICATIONS

►EN 9100 ►ISO 9001

CEiiA

> **Establish Portugal as a reference within the space industry, particularly in the development of technologies, products and systems, conceived, industrialised and operated from Portugal.**

CEiiA is a Portuguese private engineering and product development centre whose vision is to establish Portugal as a reference within the automotive, urban mobility, aeronautics, ocean and space industries, particularly in the development of technologies, products and systems, conceived, industrialised and operated from Portugal.

PRODUCTS/ SERVICES

[1] **Satellite Structures** [TRL 7]
CEiiA develops versatile satellite structures that have been adapted to support the necessary avionics and payloads, protecting them from the space environment and the launcher demanding loads.

[2] **Launcher Structures** [TRL 6]
Development and prototyping of structural solutions for micro-launchers, supporting different components and systems.

[3] **Software Services** [TRL 5]
CEiiA designs, develops and implements services for SW components for the user segment and EO ground segment services.

[1] CEiiA Headquarters
[2] Small launcher Orbital stage and payload fairings development and manufacturing
[3] CEiiA's Integrated Ocean Management Platform

CEiiA

EST. 1999

Tiago Rebelo
[Ocean and Space Unit Director]

Matosinhos, Évora [PT]

CONTACT

E ceiia@ceiia.com
W www.ceiia.com
T +351 220 164 800

RESEARCH DOMAIN

- Earth Sciences
- Astrophysics and Space Sciences
- Computing and Software

AFFILIATION

- Faculty of Sciences of the University of Porto

CICGE,
Faculty of Sciences

CICGE promotes sustainable development through innovation in the areas of Earth Observation and Space Sciences.

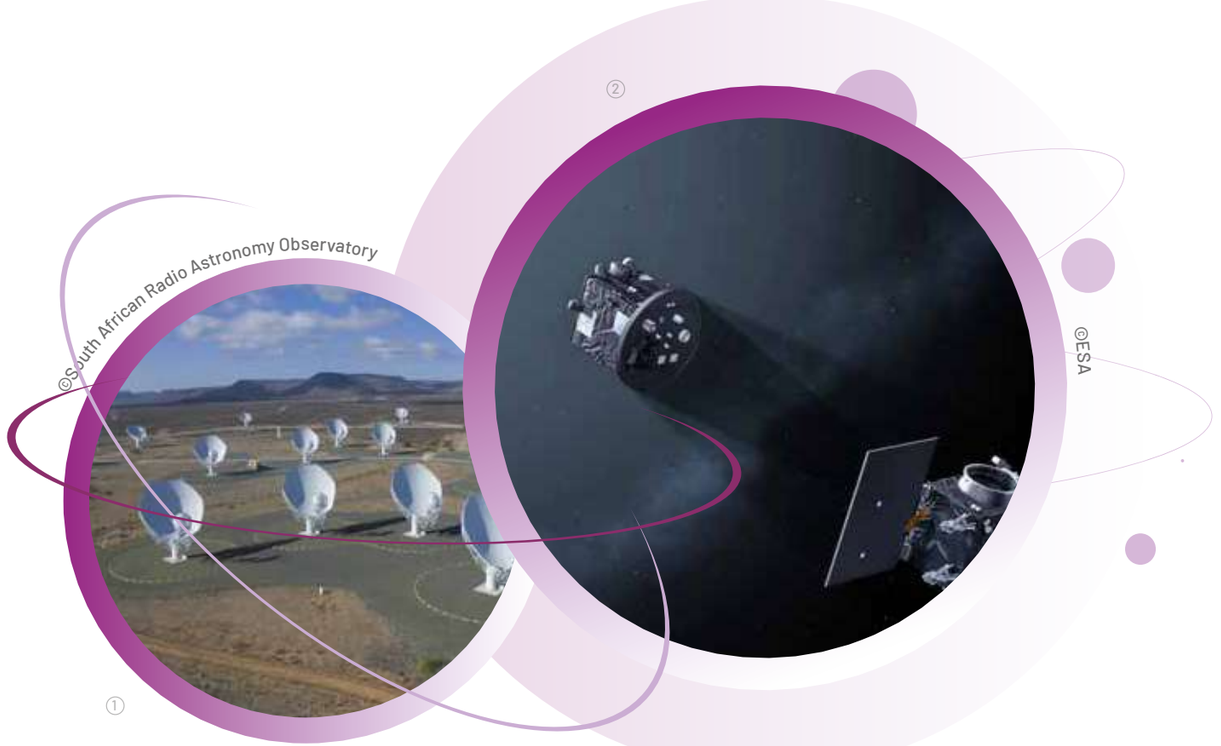
In 1975 researchers from the Astronomical Observatory from the Porto University started the Center of Astronomy from the University of Porto. With the advancement of space exploration the center expanded its scope to include Remote Sensing and Earth Observation and in 1998 its name was changed to "The Center for Research in Geo-Space Sciences." Besides fundamental science driven research CICGE provides services and develops software for ESA [Proba3 mission], the Square Kilometre Array Observatory, and GSA [Galileo Reference Centres].

PRODUCTS/ SERVICES

[1] **ENGAGE SKA [ENAbling Green E-science for SKA]**
The only Portuguese Infrastructure dedicated to Astronomy and Astrophysics.

[2] **Galileo Reference Center - Member States (GRC-MS)**
CICGE researchers participate in the workpackages related to evaluating performance of Galileo for airborne GNSS applications.

[3] **MONTOBEO - Montesinho Biodiversity Observatory**
An Earth Observation Tool For Biodiversity Conservation. MONTOBEO implements an early-warning system using time series of satellite remote sensing data and ecological niche models to identify changes on habitat quality and therefore estimate species' extinction risk over time and space.



[1] Proba-3 satellites form artificial eclipse to enable scientific studies of the solar corona.
[2] The core of the MeerKAT radio telescope, a SKA precursor, shortly before completion.

CICGE

EST. 1975

Dalmiro Jorge Filipe Maia
[Director/ Coordinator]

Vila Nova de Gaia [PT]

CONTACT

E dmaia@fc.up.pt
W www.fc.up.pt/cicge
T +351 227 861 290

RESEARCH DOMAIN

- Earth Sciences
- Instrument Technologies

AFFILIATION

- University of Algarve

NON-SPACE SECTORS OF ACTIVITY

- Coastal Risks
- Long-term Observations of Transitional Waters
- Deep-sea Mining
- Biofuel Production

CIMA – Centre for Marine and Environmental Research, University of Algarve

Deepening Ocean knowledge with Earth Observation.

CIMA is a multidisciplinary centre of excellence in marine and environmental research. CIMA engages with society to implement important decisions about Blue and Green Growth thus contributing to the delivery of Sustainable Development Goals. The mission of CIMA is to deepen scientific knowledge of marine and environmental systems, support and encourage innovation, and provide training, integrating two main research areas: Ocean and Coastal Dynamics and Environmental Systems and Resources. CIMA supports managers and decision-makers defining best practices on environmental, coastal and marine strategies and planning.

PRODUCTS/ SERVICES

[1] **Validation of Ocean Colour Sensors**
Validation of MERIS and OLCI ocean colour sensors under ESA projects (Technical Assistance for the Validation of MERIS marine products at Portuguese oceanic and coastal site and Sagres Validation Ocean Colour Portugal (SagValOCPort) through in situ bio-optical and radiometric data collection.

[2] **High-quality in situ data for ocean colour algorithm development**
CIMA provides laboratory determination of in situ bio-optical parameters (phytoplankton pigments, particulate, and dissolved absorption coefficients) required for testing the existent and training new ocean colour algorithms.

[3] **Earth Observation for Aquaculture and the Blue economy sectors support**
CIMA collaborated in European Projects AQUA-USERS - Aquaculture Users Driven Operational Remote Sensing Information Services and GAIN – Green Aquaculture Intensification in Europe aiming at the incorporation of remote sensing data for offshore aquaculture water quality forecasting.

[1] Radiometer deployed during validation activities of ESA Ocean Colour sensors
[2] In situ remote sensing reflectance measurements using TRIOS RAMSES radiometer
[3] CIMA-Sagremarisco Ocean Colour Validation Team

UAlg CIMA
UNIVERSITY OF ALGARVE
CENTRE FOR MARINE AND ENVIRONMENTAL RESEARCH

EST. 1998

Maria João Bebianno
[Director/ Coordinator]

Faro [PT]

CONTACT

E cima@ualg.pt
W www.cima.ualg.pt
T +351 289 244 434

Sónia Cristina; Priscila Goela
sccristina@ualg.pt; prgoela@ualg.pt

RESEARCH DOMAIN

- Earth Sciences
- Planetary Sciences
- Astrophysics and Space Sciences

AFFILIATION

- University of Coimbra

NON-SPACE SECTORS OF ACTIVITY

- Geomagnetism
- Seismology
- Tectonics
- Petrology
- Stratigraphy

CITEUC – Centre for Earth and Space Research of the University of Coimbra

> **Exploration is really the essence of the human spirit.**
>
> — Frank Borman

CITEUC is a Research Unit dedicated to fundamental and applied research in Earth and Space sciences. CITEUC has 2 research groups: i) Earth Dynamics, focusing on Earth's inner structure and processes therein, crustal evolution, and Earth's history, including geomagnetism, seismology, tectonics, petrology and stratigraphy, and ii) Solar System Sciences, focusing on solar physics, minor bodies of the solar system, earth observation and planetary geology. Both with people enrolled in Knowledge Dissemination, History, Public Outreach, and Advanced Teaching.

PRODUCTS/ SERVICES

[1] **Space-Planetary Interactions monitoring and forecasting Laboratory (SPINLab)** CITEUC is in Portugal a pioneer in Space Weather for which it developed an infrastructure for the monitorization of relevant data. In addition to other reference sources, SPINLab uses observations from University of Coimbra's Geophysical and Astronomical Observatory to obtain a characterisation of local conditions.

[2] **The Earth Observation Laboratory of the University of Coimbra (EOLab)** EOLab is a partnership between CITEUC and the Department of Earth Sciences, to develop innovative monitoring tools (Land+Oceans+Atmosphere) using remote sensing technologies. EOLab is also actively developing advanced training programs for existing and emerging user communities.

[3] **Geomagnetically induced currents in Portugal mainland (MAG-GIC)** The MAG-GIC project main goal is to produce the chart of Geomagnetically Induced Currents (GIC) risk hazard in the distribution power network of Portugal mainland. The project is carried out with REN, the Portuguese HV network operator.

[1] Bennu Asteroid (OSIRIS-Rex mission - NASA)
[2] Solar data from University of Coimbra's Geophysical and Astronomical Observatory, made available by CITEUC through SPINLab
[3] Assessment of the hazards associated with geomagnetically induced currents in high-voltage power lines

CITEUC
CENTRO DE INVESTIGAÇÃO DA TERRA E DO ESPAÇO
UNIVERSIDADE DE COIMBRA

EST. 2015

João Manuel de Morais Barros Fernandes [Director/ Coordinator]

Coimbra [PT]

CONTACT

E citeuc.direcao@gmail.com
W www.citeuc.pt
T +351 914 002 960

João Fernandes
citeuc.direcao@gmail.com

RESEARCH CENTRES

RESEARCH DOMAIN

- Earth Sciences
- Planetary Sciences
- Computing and Software

AFFILIATION

- CoLAB

NON-SPACE SECTORS OF ACTIVITY

All +ATLANTIC activities fall within one or more of its 5 scientific priorities or axes:

- Axis 1: Sustainability of marine resources
- Axis 2: Atlantic observation and monitoring
- Axis 3: Impact of climate change on the Atlantic
- Axis 4: Future technologies for the Oceans
- Axis 5: Data science and Big Data

CoLAB +Atlantic

Unleashing the potential of the Atlantic for the benefit of society.

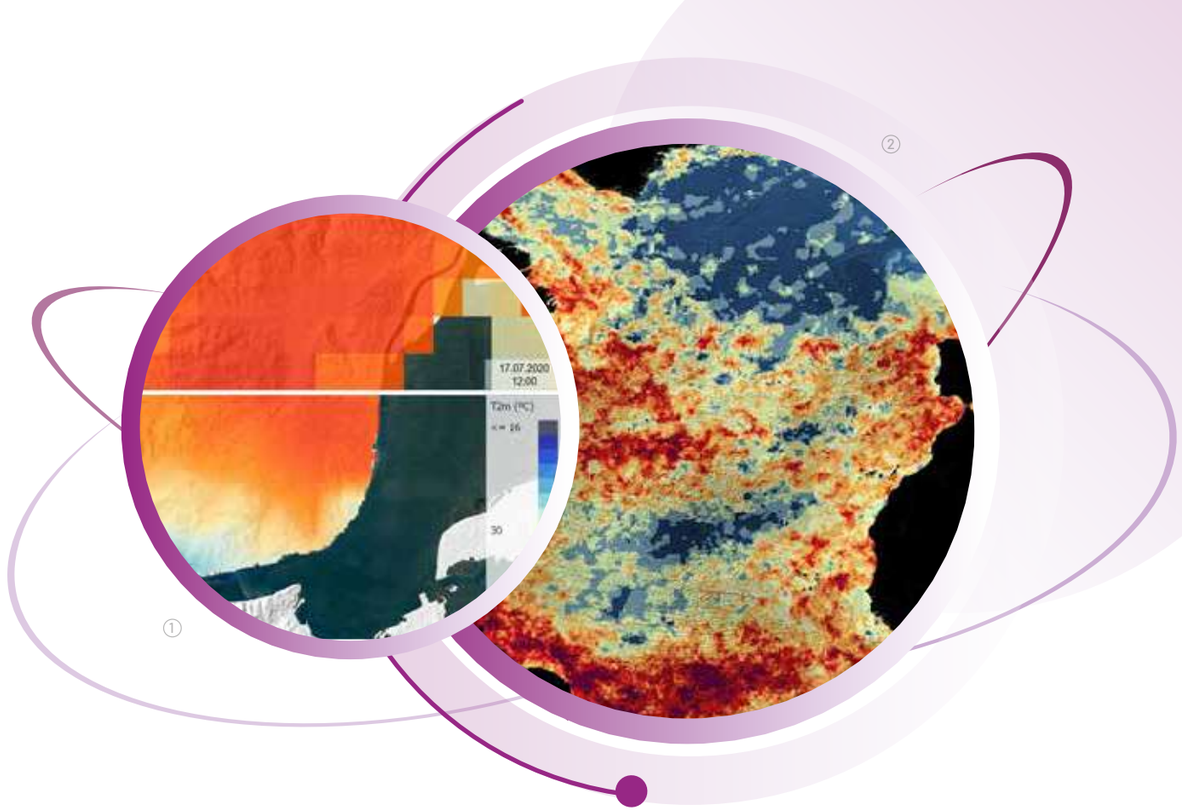
+ATLANTIC is a non-profit private association comprising 13 Portuguese members, active in the Ocean and Space domains. +ATLANTIC aims at advancing knowledge on the interactions between the Ocean, Atmosphere, Climate and Energy in the Atlantic, with an integrated approach from deep sea to space. The CoLAB builds on advanced research in Space, Ocean and Energy technologies, as well as in Data Science, fostering the production of new knowledge, products and services about the ocean and its interactions.

PRODUCTS/ SERVICES

[1] **Use cases, requirements and value propositions definition** [TRL 9]
Domain expertise in Ocean and Space domains. Examples include coupling EO, Modelling and IA in support of offshore aquaculture and wind energy site selection and management; marine heatwaves detection; correlations between NO2 concentration anomalies and ship presence detected via AI and support to the definition of an Atlantic Constellation requirements in partnership with the AIR Centre.

[2] **Coast.SENSE** [TRL 7]
User-friendly pilot tool to deliver added-value interdisciplinary information on near-surface NO2 concentration levels, near-surface air temperature and excess heat exposure, sea water quality, overtopping risk assessment and high-resolution CO2 concentrations and emissions mapping.

[3] **Harmful Algal Blooms Detection and Prediction** [TRL 6]
Detection and prediction of HAB events on the Portuguese coast, using satellite imagery and wind data and employing deep learning techniques. The model has strong detection capabilities, achieving an average accuracy of around 84% on 10-day predictions.



[1] CoastSENSE - Urban heatwaves in Cascais
[2] Marine heatwave evolution in the Atlantic

CoLAB +ATLANTIC

EST. 2019

Nuno Lourenço
[Director/ Coordinator]

Cascais, Matosinhos, Peniche, Ponte de Sor [PT]

CONTACT

E info@colabatlantic.com
W www.colabatlantic.com
T +351 965 281 031

André Oliveira
andre.oliveira@colabatlantic.com

RESEARCH DOMAIN

Earth Sciences

AFFILIATION

University of Évora

EaRSLab,
at the University of Évora

Space-based EO supports a sustainable development for the future in Portugal.

The Earth Remote Sensing Laboratory [EaRSLab] brings together a multi-disciplinary team to promote and conduct applied research in cutting-edge remote sensing, modelling and geo-computation methodologies to understand better of the global environmental changes, risks and their impacts on Earth's systems. The EaRSLab's mission aims at: i] increasing the excellence in Earth remote sensing research by focusing on three key application areas: Atmosphere, Land and Water; ii] contributing to the training of the next generation of remote sensing scientists.

PRODUCTS/ SERVICES

[1] **Earth Observation**
Observing the Earth at local, regional, and global spatial scales

[2] **Earth System**
Improved understanding of the Earth as an integrated system

[3] **Earth Sustainability**
Increasing Earth Sciences literacy for a sustainable future

[1+2+3] Representation of the main remote sensing activities at EaRSLab

EST. 2020

Maria João Costa
[Director/ Coordinator]

Évora [PT]

CONTACT

E earslabue@gmail.com
W www.earslab.ict.uevora.pt
T +351 266 745 309

Maria João Costa
mjcosta@uevora.pt

RESEARCH DOMAIN

Astrophysics and Space Sciences

AFFILIATION

University of Madeira

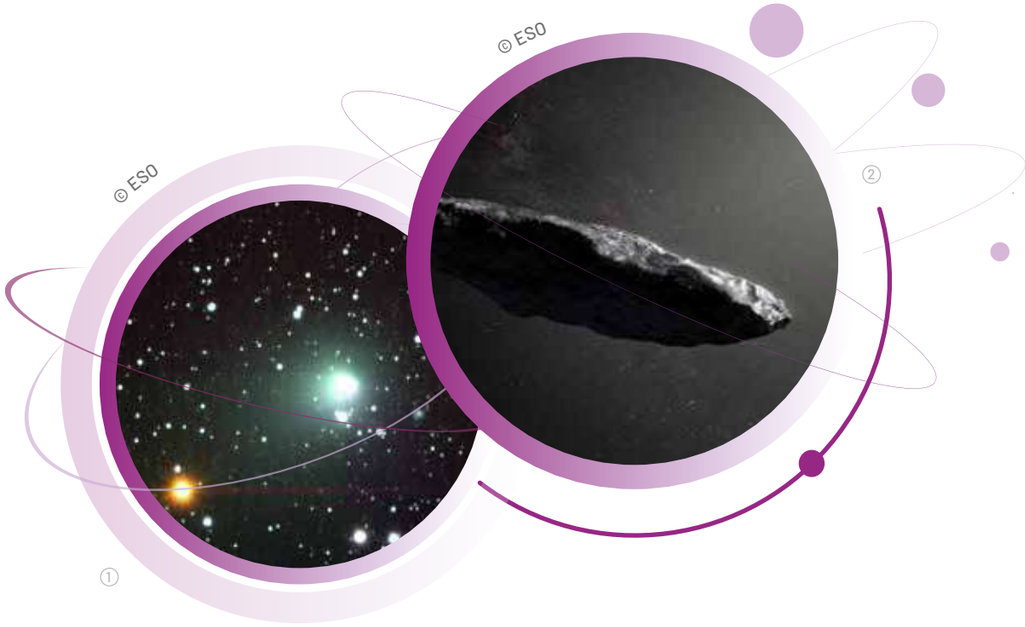
NON-SPACE SECTORS OF ACTIVITY

- Cosmology
- Astrophysics
- Astronomy Outreach
- Observational Astronomy

GAUMa – Grupo de Astronomia da Universidade da Madeira

Madeira seeing the Universe!

The Astronomy Group of the University of Madeira [GAUMa] was formally born in June 2000. Its guiding principles include Teaching, Research and Outreach of Astronomy in the Autonomous Region of Madeira [RAM].
The research areas covered in work done by elements of GAUMa focus on young radio galaxies, primordial black holes, cosmology, gravitational lenses, systems composed of n-black holes, selection of sites for the installation of observatories [radio and optical], applications of Astronomy in the teaching of Mathematics, teaching and dissemination of Astronomy and the history of Astronomy in Madeira.



[1] Comet Hale-Bopp
[2] Artist's impression of the interstellar asteroid 'Oumuamua'

PRODUCTS/ SERVICES

[1] **Primordial Black Holes (PBHs)**
Study of the formation and evolution of PBHs in the early Universe and their relation to Cosmic Dark Matter and Gravitational Wave events.

[2] **Astronomy Public Outreach**
Promote lectures and astronomical observing sessions in schools of all educational levels and in events open to the general public.

[3] **Optical Observatory**
Installing and operating of an optical observatory on the island of Madeira (scientifically proven to have some of the best locations for astronomical observation in the northern hemisphere) with the potential to study variable stars and track Near Earth Objects.

UNIVERSIDADE da MADEIRA
www.uma.pt

EST. 2000

José Laurindo de Góis Nóbrega Sobrinho [Director/ Coordinator]

Funchal - Madeira [PT]

CONTACT

E astro@uma.pt
W www3.uma.pt/Investigacao/Astro/Grupo
T +351 291 705 000

RESEARCH CENTRES

RESEARCH DOMAIN

- Planetary Sciences
- Astrophysics and Space Sciences
- Other: Astromical Instrumentation

AFFILIATION

- Institute for Astrophysics and Space Sciences, FCUL - University of Lisbon, CAUP / University of Porto, OGAUC / University of Coimbra

NON-SPACE SECTORS OF ACTIVITY

- Science Communication

IA - Instituto de Astrofísica e Ciências do Espaço

Shedding light on the Universe.

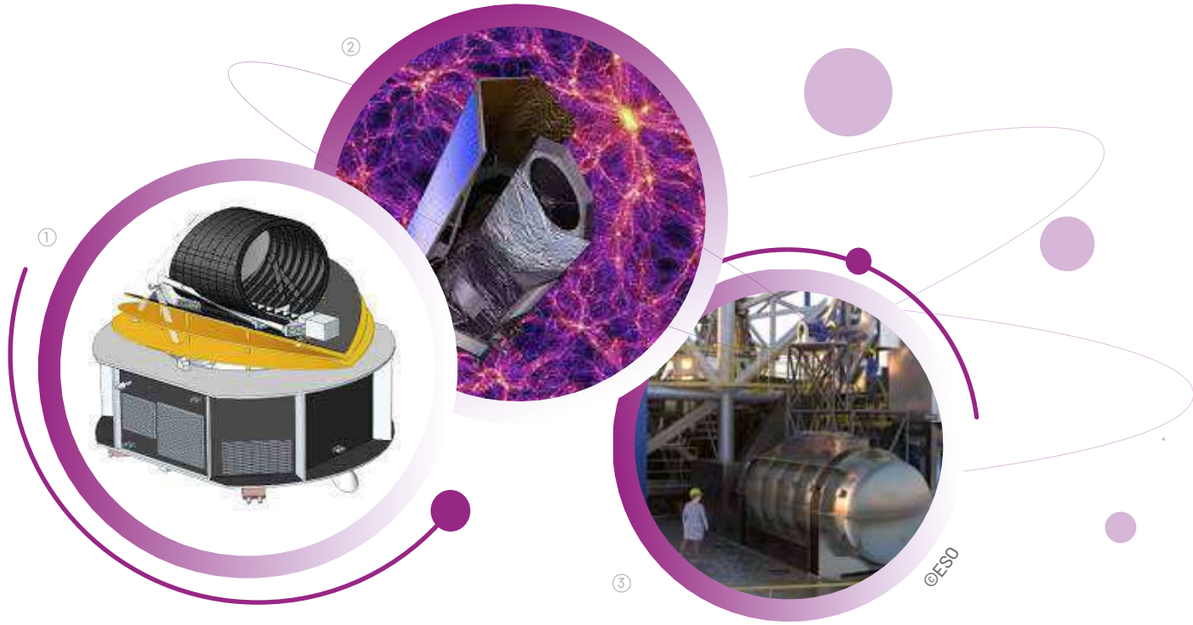
The Instituto de Astrofísica e Ciências do Espaço [IA] is a research infrastructure with a national dimension, embodying a bold vision for the development of Astrophysics and Space Sciences in Portugal. IA fosters high-impact research, with special attention to training and science communication. IA strives to achieve international leadership in key areas, realising the potential created by the national membership of ESA, ESO and SKA, namely in the astronomical instrumentation domain. This is done through state-of-the-art research, enabled by our leading participation in strategic international ground and space-based projects and missions.

PRODUCTS/ SERVICES

[1] **Software, algorithms and data pipelines for space based projects:** developed for ESA missions CHEOPS and Euclid.

[2] **Development of OGSE and Metrology subsystems:** In particular for ESA missions PLATO, ARIEL, eLISA and Athena.

[3] **Development of OGSE and Metrology subsystems:** In particular for ESA missions PLATO, ARIEL, eLISA and Athena.



[1] ESA's Ariel [Atmospheric Remote-sensing Infrared Exoplanet Large-survey] mission, planned to be launched in 2028
[2] The Euclid ESA's mission, to be launched in 2022 to study the structure of the Universe
[3] ESO high-resolution Extremely Large Telescope instrument HIRES will allow astronomers to study astronomical object that require highly sensitive observations is planed to have the first light in 2030

ia instituto de astrofísica e ciências do espaço

EST. 2014

José Afonso
[Director/ Coordinator]

Lisbon, Porto, Coimbra [PT]

CONTACT

E geral@iastro.pt
W www.iastro.pt
T +351 213 616 739
+351 226 089 830

Alexandre Cabral
Alexandre.Cabral@ciencias.ulisboa.pt

Artist's impression showing L 98-59b, one of the planets in the L 98-59 system 35 light-years away. The system contains four confirmed rocky planets with a potential fifth, the furthest from the star, being unconfirmed.In 2021, astronomers used data from the Echelle SPectrograph for Rocky Exoplanets and Stable Spectroscopic Observations (ESPRESSO) instrument – which counted with Portuguese participation for its development - on ESO's VLT to measure the mass of L 98-59b, finding it to be half that of Venus. This makes it the lightest planet measured to date using the radial velocity technique.

RESEARCH DOMAIN

- Spacecraft and Robotic Technologies
- Instrument Technologies

AFFILIATION

- LAETA - Associated Laboratory for Energy, Transports and Aeronautics

NON-SPACE SECTORS OF ACTIVITY

- Industry Support
- Capital Goods
- Automotive and Transports
- Civil Infrastructures
- Renewable Energy
- Sea Economy
- Health and Sports

INEGI

Contributing to the competitiveness of our industrial partners, while creating technological solutions for a more secure and sustainable Space.

INEGI is an industry-oriented Research and Technology Organisation, non-profit, private and recognised as a public utility entity. INEGI aims to transform R&D investment in economic and social value, and about 50% of its total turnover of 11.1 million EUR comes from R&D and innovation projects funded by the industry. Its technology-based innovation activities applied to space covers new materials, advanced manufacturing processes, design of structures, mechanical systems, and testing.

PRODUCTS/ SERVICES

[1] **Lightweight materials and advanced manufacturing processes** [TRL 5]
Development of materials solutions to improve performance and add new functionalities in spacecraft systems, including nanomaterials, lightweight composites and metals, and of associated manufacturing processes, including additive manufacturing, complex architectures production and new joining methods.

[2] **Design of structures and mechanical systems** [TRL 6]
New structural and systems concepts development based on topoogy optimization strategies, multiscale and multi-material modelling and lean design applied to complex systems.

[3] **Prototyping and testing for spacecraft sub-components** [TRL 7]
In-house prototyping of sub-components, including new materials and manufacturing and integration methods, and development of support and test systems, including 0g off-loading for high precision and large structures, thermal and vacuum testing, and structural performance verification.

[1] Space-grade pre-impregnated carbon fibre composite materials
[2] Mechanical ground support equipment for deployable arm test
[3] Manufacturing of a lightweight composite structure

inegi driving science & innovation

EST. 1986

Alcibíades Paulo Guedes
[Chairman of the Board of Directors]

Porto, Évora [PT]; Istanbul [TR]; Fortaleza [BR]

CONTACT

E space@inegi.up.pt
W www.inegi.pt
T +351 229 578 710

Nuno Rocha [Research Coordinator & Business Development]
nrocha@inegi.up.pt

© ESA/ATG Medialab

Sentinel-6 Michael Freilich, launched on 21 November 2020, was the first ESA-developed satellite to be given a ride into space on the SpaceX Falcon 9 rocket. Portugal is set to be part of the future of the Copernicus Programme: Active Space Technologies, Critical Software, Deimos Engenharia, FHP and INEGI were selected by the European Space Agency to develop some of the components of the new Copernicus missions.

© NASA/Isaac Watson

RESEARCH CENTRES

RESEARCH DOMAIN

- Spacecraft and Robotic Technologies
- Communication and Navigation
- Computing and Software

AFFILIATION

- University of Porto
- Polytechnic Institute of Porto
- University of Minho
- University of Trás-os-Montes and Alto Douro
- INESC - Institute for Systems Engineering and Computers

NON-SPACE SECTORS OF ACTIVITY

- Computer Science
- Industrial and Systems Engineering
- Networked Intelligent Systems
- Power and Energy

INESC TEC –
Institute for Systems and Computer Engineering, Technology and Science

From knowledge generation to science-based innovation.

INESC TEC is a private non-profit research institution, dedicated to scientific research and technological development, technology transfer, advanced consulting and training, and pre-incubation of new technology-based companies. INESC TEC hosts over 800 integrated researchers (about 350 PhDs) organized in 13 R&D Centres.

PRODUCTS/ SERVICES

INESC TEC projects at ESA:

[1] **Spectrometer for Marine Litter [2019-2021]**
Proof-of-concept experiments towards a future satellite-borne sensor system able to efficiently detect plastics in the ocean. [TRL 7]

[2] **CYCLOPS [2013-2014]**
Development of a single-pixel imaging LIDAR system based on compressive sensing. [TRL 7]

[3] **High-Resolution Micro-Optics Filters for LIDAR Applications [2005]**
Development of an ultra-narrow transmission filtering scheme that combines the response of a phase-shift fiber Bragg grating and a broadband rejection micro-optical filter. [TRL 7]

[1] INESC TEC headquarters
[2] Cyclops Prototype
[3] Optical and Electronic Technologies Research Laboratory

INESCTEC

EST. 1985

José Manuel Mendonça
[Chairman of the Board]

Porto, Braga,
Vila Real [PT]

CONTACT

E info@inesctec.pt
W www.inesctec.pt
T +351 222 094 000

António Gaspar (Space Point of Contact)
antonio.gaspar@inesctec.pt

RESEARCH DOMAIN

- Communications and Navigation
- Computing and Software
- Other: Design of Electronic and Photonic Circuits and Related Technologies

NON-SPACE SECTORS OF ACTIVITY

- Wireless Technologies
- Optics and Photonics
- Information and Data Sciences
- Networks and Services
- Basic Sciences and Enabling Technologies

Instituto de Telecomunicações

Creating and sharing knowledge for Telecommunications.

IT is a partnership of nine institutions with research and development. The mission of IT is to create and disseminate new knowledge and support advanced training in the broad field of the Technologies of Information as well as Communications and Electronics (TICE), with a special emphasis on Telecommunications. As an Associated Laboratory IT addresses societal challenges by providing enabling TICE through transdisciplinary cooperation with specialists in relevant fields. IT is actively involved in fundamental and applied research both at national and international levels. IT also plays its role towards public society with public awareness initiatives, knowledge transfer to industry and by providing consulting services on a non-competing basis.

PRODUCTS/ SERVICES

[1] **BEACON -** integrates an innovative photonic beamformer (BFN) using CMOS compatible silicon photonic fabrication together with Ge diodes. The BFN chip consumes <7.5-times less chip area than lowindex contrast BFNs. It allows four orders of magnitude faster beamsteering.[TRL7]

[2] **GANSAT -** Power Amplifier Design for Space Applications based on GaN transistors.

[3] **ENGAGE SKA -** This project sets up a training and sustainability plan for a Green e-Science Infrastructure fostering Portugal's participation in the ESFRI SKA project along the Big Data and Green Power axis, which will act as a driver for smart and sustainable growth along some of the less developed regions of Portugal taking radio astronomy as an Innovation Open Living Lab.

[1] BEACON - Photonic beam forming
[2] Engage-SKA Infrastructure of Porto da Balsa, Pampilhosa da Serra

instituto de telecomunicações

EST. 1991

José Carlos Esteves Duarte Pedro [Director/ Coordinator]

Aveiro [PT]

CONTACT

E it@av.it.pt
W www.it.pt
T +351 234 377 900

Daniel Filipe Fernandes Martins Poças
pocas.daniel@av.it.pt

RESEARCH DOMAIN

- Earth Sciences
- Other: Space-based Marine Monitoring

AFFILIATION

- Portuguese Government

NON-SPACE SECTORS OF ACTIVITY

- Bathymetric coverage
- Hydrography
- Safety of navigation
- Nautical charts and publications production
- Coastal ocean observation
- Oceanography
- Marine geology
- Marine chemistry

Instituto Hidrográfico

Satellite Based Technologies and Remote Sensing provides relevant data for ocean monitoring.

The Instituto Hidrografico (IHPT), created in 1960, is a Portuguese Navy organization. It is recognized as a State Laboratory under the authority of the Minister of National Defence and joint supervision of the Ministries of Education and Science and Agriculture, Sea and Environment. IHPT ensures the activities of research and development related to science and techniques of the sea, given the priority application in the defence, contribute to ocean science. It is also internationally engaged in investigating the oceans providing nautical charts and navigational services of the Portuguese coast, ports, and ocean waters.

PRODUCTS/ SERVICES

[1] **Project 4S**
4S will address current data and solution gaps from coastal and offshore stakeholders, which can generate and access spatial and recent information on the seabed, such as benthic habitat, morphology, depth, and change and trends. Digital information on these is crucial to respond to EC maritime directives, environmental impact studies, and offshore engineering activities.

[2] **MELOA**
The MELOA project proposes to develop a low-cost, easy-to-handle, wave resilient, multi-purpose, multi-sensor, extra light surface drifter for use in all water environments, ranging from deep-sea to inland waters, including coastal areas, river plumes, and surf zones.

[3] **Coastal Research Synergy Framework (Co-ReSyF)**
Dedicated data access and processing infrastructure, with automated tools, methods, and standards to support research applications using Earth Observation (EO) data to monitor Coastal Waters. Grant access to Earth Observation data and pre-processing tools to the research community towards the future provision of future Coastal Waters services based on EO data.

[1] In-situ sensors with real data transmission by satellite
[2] Satellite Derived Bathymetry for the Faro – Olhão and Armona navigation channels
[3] MELOA drifters in oil spill simulation exercise

hidrográfico marinha · portugal

EST. 1961

Miguel Pércio Bessa Pacheco [Director/ Coordinator]

Lisbon [PT]

CONTACT

E geral@hidrografico.pt
W www.hidrografico.pt
T +351 210 943 000

Space Research Team
GTSpace@hidrografico.pt

RESEARCH CENTRES

RESEARCH DOMAIN

Other: Management and Economics

AFFILIATION

University of Coimbra

NON-SPACE SECTORS OF ACTIVITY

- Training
- Consultancy
- Automation
- Materials
- Informatics
- Phytopathology
- Geotechnics

CERTIFICATIONS

- NP EN ISO/IEC 17025:2005
- DGERT certified training areas:
  [090], [220], [222], [341], [342], [344], [345], [347],[380], [481], [482], [862]

Instituto Pedro Nunes

Promoting innovation and tech transfer from research to industrial sectors.

Instituto Pedro Nunes manages ESA Space Solutions Portugal, comprising ESA BIC Portugal, ESA Business Applications Ambassador Platform and ESA Technology Brokers and also offers personalised ESA consultant and tailored project management support.

PRODUCTS/ SERVICES

[1] **ESA BIC Portugal**
Business incubation centre, incubation programe for startups up to 5 years to develop their prototypes with funding [50.000€], business and technical support.

[2] **ESA Business Applications Ambassador Platform**
Stimulate Portuguese stakeholders to submit innovative business ideas, based on space assets, to ESA Business Application funding opportunities.

[3] **ESA Technology Brokers**
Identify, promote and foster technology transfer opportunities between space and non-space sectors.

[1] IPN first building
[2] IPN Research Laboratory
[3] IPN newer facilities

IPN
INSTITUTO PEDRO NUNES

EST. 1991

Teresa Mendes
[Director/ Coordinator]

Coimbra [PT]

CONTACT

E space@ipn.pt
W www.space.ipn.pt
T +351 239 700 900

Jorge Pimenta
jpimenta@ipn.pt

RESEARCH CENTRES

RESEARCH DOMAIN

- Astrophysics and Space Sciences
- Spacecraft and Robotic Technologies
- Instrument Technologies

AFFILIATION

- Instituto Superior Técnico of the University of Lisbon

NON-SPACE SECTORS OF ACTIVITY

- Nuclear Fusion
- Plasma Technologies
- Lasers

CERTIFICATIONS

- ECSS certification for the Hypersonic Plasmas Laborator

IPFN,
at Instituto Superior Técnico of the University of Lisbon

Knowledge for tomorrow's technologies.

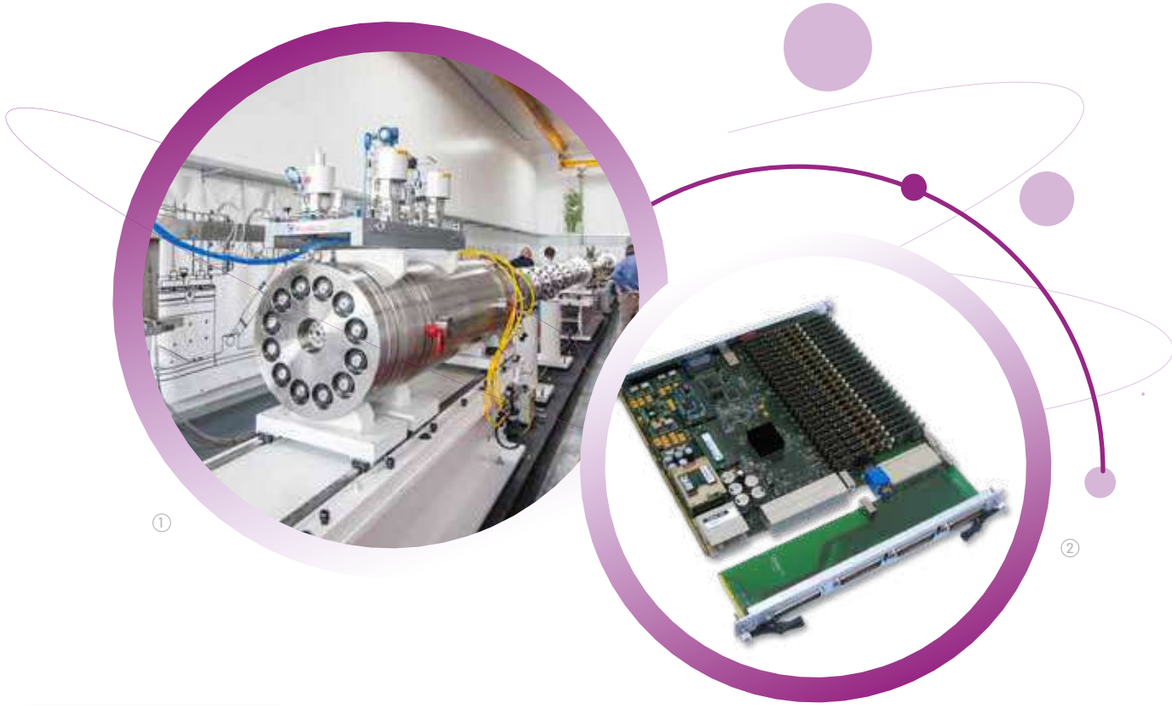
Instituto de Plasmas e Fusão Nuclear is an Associated Laboratory of Instituto Superior Técnico focused on Plasma Science and Engineering. With over 100 researchers holding a Ph.D., IPFN is one of the top Physics laboratories in the country. IPFN Space-based activities focus on plasmas for planetary exploration systems. Its Hypersonic Plasmas Laboratory hosts the European Shock-Tube for High Enthalpy Research, a key facility supporting European Space exploration programmes.

PRODUCTS/ SERVICES

[1] **European Shock-Tube for High Enthalpy Research** [TRL 7/8]
ESTHER is a laser ignited, combustion-driven shock-tube capable of achieving shock waves with speeds above 12km/s. The facility is capable of reproducing the conditions of a Spacecraft entering a planetary atmosphere, and is a key component for the planning of European exploration missions.

[2] **CFD Methods for Hypersonic Flows and Aerothermodynamics** [TRL 8]
IPFN develops and maintains Hypersonic CFD and radiative heating codes that have been applied to the Phase B design of planetary exploration spacecraft (Huygens Titan entry in 2005 and ExoMars Mars entry in 2016). Our high-temperature aerothermodynamic databases can model the entry conditions in all the planetary atmospheres of interest, for entry speeds in the 3-47km/s range.

[3] **Control and Data Acquisition Systems** [TRL 7/8]
Data Acquisition instrumentation for critical systems in fusion and space applications. The high-speed (MHz/GHz) devices have been designed as fault-tolerant, highly available systems at both hardware and software levels. Tests for availability measurement were performed and verified the correct operation of the fault-tolerance mechanism in high-radiation environments.



[1] European Shock-Tube for High Enthalpy Research
[2] 48 channels, GHz-rated Control and Data Acquisition board developed at IPFN

EST. 2007

Bruno Soares Gonçalves
[Director/ Coordinator]

Lisbon [PT]

CONTACT

E ipfn@ipfn.tecnico.ulisboa.pt
W www.ipfn.tecnico.ulisboa.pt
T +351 218 417 818

Mário Lino da Silva
mlinodasilva@tecnico.ulisboa.pt

Between 4 and 31 October 2021, the Austrian Space Forum – in cooperation with the Israel Space Agency as the host agency and D-MARS – conducted an integrated Mars analogue field mission in the Negev Desert in Israel – the AMADEE-20 Mars simulation. Three researchers from the Larsys were involved in developing robotic devices to simulate a human and robotic mission to Mars.

RESEARCH DOMAIN

Earth Sciences

AFFILIATION

- IPMA - Portuguese Institute for Sea and Atmosphere

NON-SPACE SECTORS OF ACTIVITY

- Land
- Weather
- Climate

IPMA NOT - Portuguese Institute for Sea and Atmosphere

> **Observing the Earth, Forecasting the Weather, Preparing the Future.**

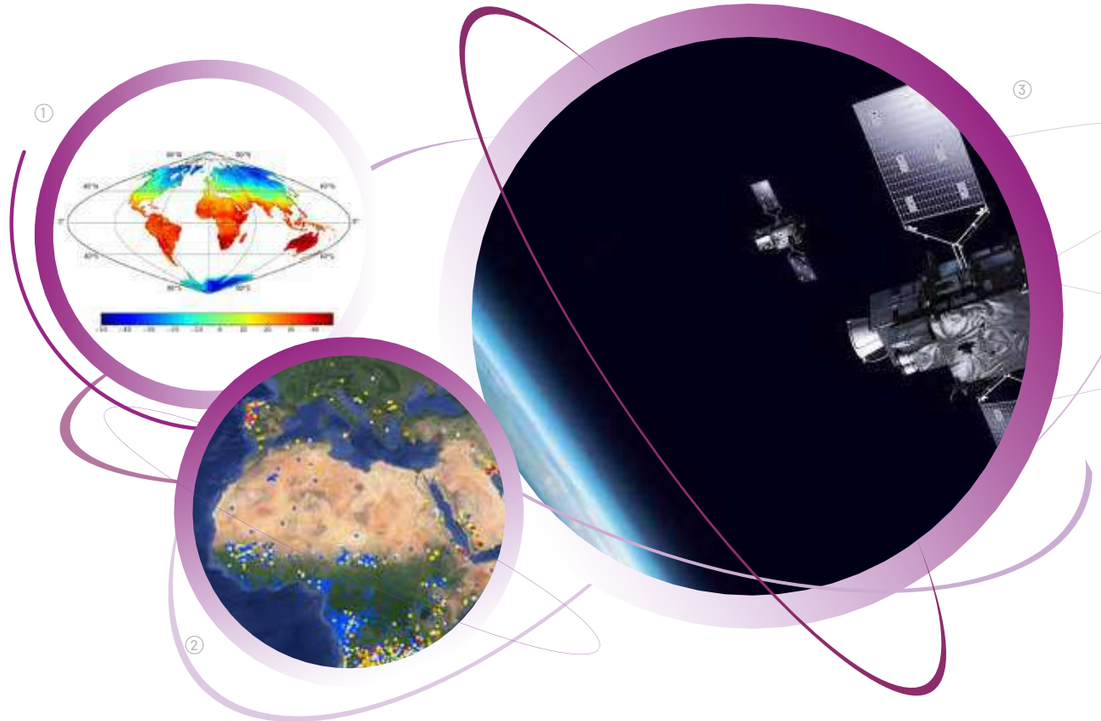
IPMA's Earth Observation Unit [NOT] explores satellite data to monitor and understand the climate system. Over the last decades, IPMA-NOT has taken advantage of its own research activities to feed the operational services it maintains for EUMETSAT and Copernicus services.

PRODUCTS/ SERVICES

[1] **EUMETSAT LSA-SAF**
Fully operational service providing land surface temperature, albedo, vegetation parameters and fire products from European meteorological satellites. The project team is preparing for the next generation of EUMETSAT satellites - Meteosat Third Generation [MTG] and EUM Polar System-Second Generation [EPS-SG].

[2] **Copernicus Global Land Service [CGLOPS]**
IPMA-NOT maintains the operational generation and distribution of land surface temperature data from a constellation of geostationary satellites [Meteosat, GOES and Himawari series]. The integration of Sentinel-3 observations to further increase area coverage is under preparation.

[3] **Land Surface Temperature Climate Change Initiative [LST CCI]**
IPMA-NOT is contributing to the development of harmonized LST datasets to allow their effective use in climate studies.



[1] METOP Land Surface Temperatures
[2] Fire Radiative Power - October 2017
[3] Meteosat Third Generation, the European geostationary mission to be launched in 2022

IPMA.NOT

EST. 2000

Isabel Franco Trigo [Coordinator]

Lisbon [PT]

CONTACT

E isabel.trigo@ipma.pt
W https://landsaf.ipma.pt/en
T +351 218 447 072

RESEARCH CENTRES

RESEARCH DOMAIN

- Spacecraft and Robotic Technologies
- Computing and Software
- Instrument Technologies

NON-SPACE SECTORS OF ACTIVITY

- Aeronautics
- Automotive
- Big Science Projects
- Infrastructures
- Energy

CERTIFICATIONS

- ISO EN 17025

ISQ

Specialised engineering at the service of your Project.

The ISQ group is a private Portuguese entity, established in 1965, with a group turnover, in 2019, of 75,9 M€ (+30% overseas), a staff of 1600 people, and permanent operations in 11 countries. ISQ is present in several markets including, since 2003, aerospace. ISQ has a testing facility and provides engineering services to clients such as Safran, Thales Alenia Space, Embraer, Lusospace, Omnidea, Tekever, the European Space Agency and through the GIE ESQS, also CNES and ArianeGroup.

PRODUCTS/ SERVICES

ISQ is aiming at provision of services all along the aerospace supply chain, from Research & Development and testing up to TRL6 of launchers and payloads; operations and engineering activities at the European Spaceport with a permanent team for more than ten years; development of B2B Earth Observation services. Our services track record includes:

[1] **ESQS** [TRL 9]
Services of Quality Assurance, Safety and Environment for the Assembly, Integration, Testing and Launching segment for the systems ARIANE 5, SOYUZ and VEGA at the CSG-Kourou - French Guyana.

[2] **Groupe SAFRAN** [TRL 4, 5, 6]
Performance of mechanical, thermomechanical and dynamic tests for technology development (phase C) and Systems Qualification (phase D) of the non-ablative Thermal Protection System of the IXV Vehicle.

[3] **ASPLAN-VIAK for ESA** [TRL 8]
Life Cycle Assessment (LCA) of Manufacturing Processes such as tank production, welding, machining and Materials such as CFRP and GFRP. LCA of space Propellants.

[1] ISQ´s anechoic chamber
[2] ISQ´s main shaker
[3] QA/QC activities at the CSG

CONTACT

E pachaves@isq.pt
W www.isq.pt
T +351 214 228 100

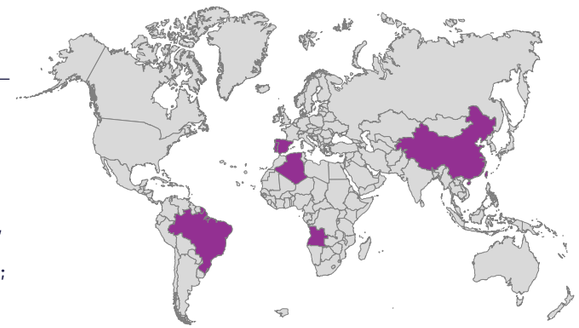
EST. 1965

Pedro Matias
[Director/ Coordinator]

Oeiras [PT]

Paulo Chaves
[Aerospace Business Line Manager]
pachaves@isq.pt

WORLD PRESENCE: Oeiras, Vila Nova de Gaia, Castelo Branco, Loulé, Monção, Viseu, Sines [PT]; Angola; Algeria; Brazil; Cape Verde; China; Spain; French Guiana; East Timor



RESEARCH DOMAIN

- Earth Sciences
- Spacecraft and Robotic Technologies
- Communication and Navigation

AFFILIATION

- Instituto Superior Técnico of the University of Lisbon

NON-SPACE SECTORS OF ACTIVITY

- Ocean
- Urban Sustainability
- Robotics

LARSyS, at Instituto Superior técnico of the University of Lisbon

> **At LARSyS we look at the sky and realize that it's full of possibilities.**

The LARSyS was founded in 2001 to conduct basic and applied research in engineering technologies relevant to industrial applications and societal challenges. LARSyS is uniquely positioned to contribute to the new research challenges because of its strong scientific background in Systems, Data Science and Learning. Also, the interdisciplinary social-technical systems approach combines analytical tools and engineering methods with social sciences and design tools and techniques of inquiry. The engagement with the social and economic implications of problems and solutions, leading to sustainable development goals through collaborations with industry, public policy recommendations and spin-off companies.

PRODUCTS/ SERVICES

[1] **Remote sensing** for precision animal farming and biodiversity monitoring.

[2] **Space robotic solutions** for orbital operations and for planetary exploration.

[3] **Robust estimation and control** for Guidance, Navigation, and Control (GNC).

[1] Space CoBot free-flyer robot prototype on an air-bearing table lab
[2] MEROP multi-modal teleoperation console being tested for the AMADEE-20 analog mission to Mars
[3] Remote sensing methods for the estimation of pasture biomass and composition

LARSyS
Laboratory of Robotics and Engineering Systems

EST. 2001

José Alberto Santos-Victor [Director/ Coordinator]

Lisbon [PT]

CONTACT

E info@isr.tecnico.ulisboa.pt
W www.larsys.pt
T +351 218 418 289

Rodrigo Ventura
rodrigo.ventura@isr.tecnico.ulisboa.pt

RESEARCH DOMAIN

Instrument Technologies

AFFILIATION

Nova School of Science and Technology

NON-SPACE SECTORS OF ACTIVITY

- Biomedics
- Atomic Physics
- Instrumentation

LIBPhys, at Nova School of Science and Technology - Nova University of Lisbon

From fundamentals to applications.

The LIBPhys is devoted to research in the areas of atomic, molecular, nuclear physics, electronic and industrial automation, instrumentation with applications to analytical methods, radiation detection, and biomedical engineering. LIBPhys activities range from the pure scientific contribution to general knowledge to the involvement in spinoff companies and the development of equipment, techniques and methods. This way, LIBPhys has a direct impact in society, not only in the Biomedical areas in collaboration with hospitals and clinics, but also with industry in the domestic and industrial energy management systems development.

PRODUCTS/ SERVICES

[1] **Thermal switches in the 3-200 K temperature range** [TRL 4]
Building of compact gas gap heat switches without mobile parts. Study by simulation and experimental measurements of the thermal conductance in the low and high thermal conductance states.

[2] **15 K Energy storage unit** [TRL 5]
400 J energy storage unit using hydrogen evaporation at 15 K as cold source and intermetallic compound for H2 gas storage.

[3] **4 kJ Energy storage unit using nitrogen gas working at 80 K**
Liquid nitrogen cell as cooling storage and large gas storage [6 Liters] at room temperature.

[1] Thermal energy storage unit: this device uses liquid hydrogen at low pressure to store 400 J between 15 K and 16 K, independently of gravity orientation
[2] Hydrogen gas gap heat switch working in the 40-80 K temperature range
High/low conductance: 1000/0.5 mW/K, Power switching ≈ 2000, Weight ≈ 210 g
[3] Visual inspection after delicate soldering process for a nitrogen gas gap heat switch

LIBPhys-UNL

EST. 2015

José Paulo Moreira dos Santos [Director/ Coordinator]

Lisbon [PT]

CONTACT

E gb@fct.unl.pt
W www. libphys.pt
T +351 212 947 842

RESEARCH DOMAIN

- Astrophysics and Space Sciences
- Instrument Technologies
- Other: Space Radiation Environment and Effects

AFFILIATION

- FCT - Fundação para a Ciência e Tecnologia
- University of Coimbra
- University of Lisbon
- University of Minho
- Instituto Superior Técnico of the University of Lisbon
- Faculty of Sciences of the University of Lisbon
- ANIMEE - Electrical and Electronic Portuguese Companies Association

NON-SPACE SECTORS OF ACTIVITY

- Particle Physics
- Instrumentation
- Health
- Scientific Computing

LIP - Laboratory of Instrumentation and Experimental Particle Physics

Towards a Shared Future of Discovery through Science and of Innovation through Technology.

LIP is an Associated Laboratory and the reference research laboratory in experimental particle physics and related technologies in Portugal. LIP is the reference partner of CERN in Portugal, and collaborates with ESA and other international scientific infrastructures. LIP is committed to R&D in experimental particle physics, new instruments and methods, including applications to Health and Space exploration, and in scientific computing.

PRODUCTS/ SERVICES

[1] **Radiation monitors** [TRL 9]
LIP develops radiation monitors for space applications (Alphasat, BepiColombo, and JUICE), performing concept studies, calibration, radiation analysis, and data exploitation.

[2] **dMEREM - detailed Mars Energetic Radiation Environment Model** [TRL 8]
Development of a Geant4 based detailed Mars Energetic Radiation Environment Model using spectroscopic data and atmospheric circulation models, including seasonal and day/night variations, with a 5x5 degree precision in latitude x longitude. dMEREM is part of SPENVIS the Space Environment Information System.

[3] **LIP and Space Instrumentation activities for gamma-ray Astrophysics** [TRL 8]
LIP develops gaseous and solid detectors for x-ray and gamma-ray astrophysics from the ground to Space having successfully conducted a balloon experiment with a CZT prototype with polarimetric capabilities.

[1] Proton Beam test of RADEM, the RADation hard Electron Monitor, to be flown in the ESA JUICE mission, the JUpiter ICy moons Explorer
[2] Student team responsible for STRAPOSPOLCA, a gamma-ray polarimetry experiment selected by the ESA BEXUS/REXUS program, at the experiment launch site, the Esrange Space Center, near Kiruna, in Sweden
[3] Checking the test setup developed at LIP for the ECO-60 project in which EEE components for the ESA JUICE mission were tested

EST. 1986

Mário Pimenta
[Director/ Coordinator]

Lisbon, Coimbra,
Braga [PT]

CONTACT

E patricia@lip.pt
W www.lip.pt
T +351 210 493 650

Patrícia Gonçalves
patricia@lip.pt

RESEARCH DOMAIN

Spacecraft and Robotic Technologies

NON-SPACE SECTORS OF ACTIVITY

- Engineering
- Computational
- Simulations
- Materials
- Energy
- Aeronautics
- Validation

PIEP – Innovation in Polymer Engineering

PIEP aims to support the global industry in the materials development, engineering, manufacturing technologies and tests applied to composite and polymer materials, products, systems.

PIEP is a private non-profit R&D organisation providing consultancy in materials, product development, processing technologies and testing for the polymer and composite industry and related sectors worldwide. Our mission: To be an Engineering Innovation Centre, with a global scope that efficiently formalises the link between the industry and u niversity, capable to respond, on time, to companies' needs, supporting industrial innovation activities and converting ideas into products. Our Vision: To be a reference partner in R&D+I for the industry at a worldwide level, promoting the materialisation of new ideas and concepts that serve as a basis for sustainable economic development and industrial competitiveness.

PRODUCTS/ SERVICES

[1] **Marco Polo-R design of a crushable TPS for the ERC -** development of a multifunctional "TPS crushable structure - cTPS" acting as a thermal and impact shield for a planetary re-entry, presenting a suitable response during Earth re-entry. [TRL 3/4]

[2] **Production of electrically conductive thermoplastic filament using graphene (EXPRO) -** production of an electrically conductive thermoplastic filament using graphene for additive manufacturing by Fusion Deposition Modelling (FDM). [TRL 5/6]

[3] **NACO -** non-conventional matrix / CNT reinforced composite - potential CNT based polymer material definition. [TRL 3]

[1] ESA CTPS Breadboard after tested and sliced to view results
[2+3+4] Production setup and test of the filament produced

piep

EST. 2001

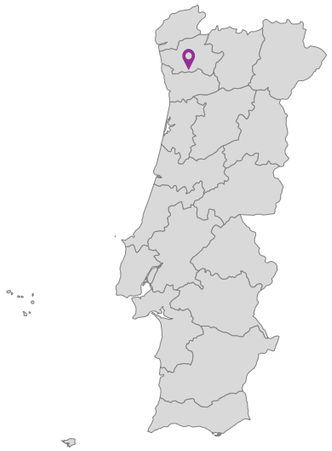
Claudia Cristovão
[Director/ Coordinator]

Guimarães [PT]

CONTACT

E geral@piep.pt
W www.piep.pt
T +351 253 510 050

Carlos Ribeiro
carlos.ribeiro@piep.pt



RESEARCH DOMAIN

- Earth Sciences
- Computing and Software

AFFILIATION

- Faculty of Sciences of the University of Porto

UPorto Satellite Altimetry **Group** at the University of Porto

Placing Portugal on the leading edge of ocean's observation from Space.

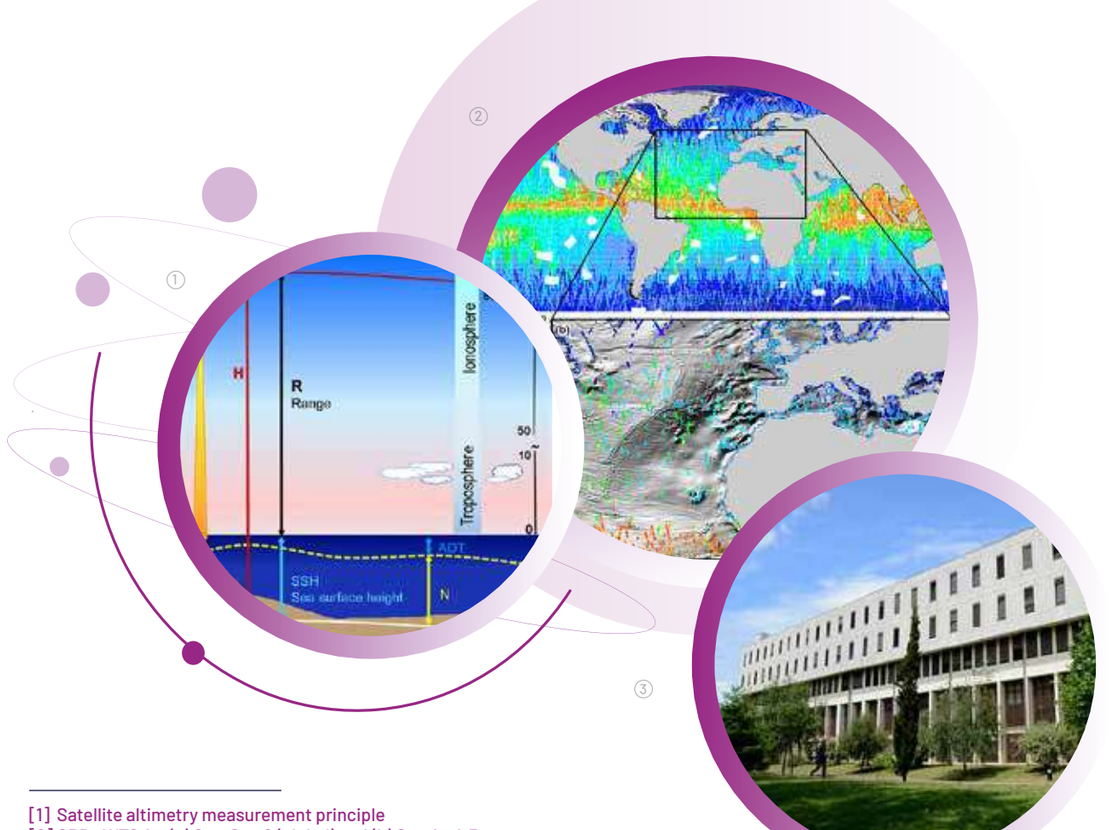
The main topic of research of this team of the Faculty of Sciences, University of Porto (FCUP), is Remote Sensing - Satellite Altimetry. In the last two decades, the research has been focused on: 1) the development of methodologies for improving the range and geophysical corrections required to derive accurate surface heights from satellite altimeter observations, with a focus on coastal and inland water regions; 2) satellite altimetry applications (e.g., marine gravity field, ocean circulation and sea level studies at global and regional scales). This research has been developed in the scope of projects funded mainly by the European Space Agency (ESA) and EUMETSAT.

PRODUCTS/ SERVICES

[1] **GPD4S3 (funded by EUMETSAT)**
Development, implementation and operational computation and delivery of daily GNSS-derived Path Delay Plus (GPD+) wet tropospheric correction (WTC) for Sentinel-3A and -3B satellites.

[2] **CRYOSAT IPF/COP Maintenance and Evolution Support (funded by ESA)**
Development, implementation and operational computation and delivery of daily GPD+ WTC for the CryoSat-2 satellite.

[3] **Sea Level Climate Change Initiative (SL CCI) (funded by ESA)**
Development of improved and long-term stable tropospheric corrections for the generation of a sea level dataset for climate studies, for all available satellite altimetry missions, with a focus on coastal regions.



[1] Satellite altimetry measurement principle
[2] GPD+ WTC for (a) CryoSat-2 (global) and (b) Sentinel-3 (coastal zones and invalid radiometer measurements)
Bottom figure shows mean sea surface computed from satellite altimetry
[3] FCUP facilities

U.PORTO
FACULDADE DE CIÊNCIAS
UNIVERSIDADE DO PORTO

EST. 2000

Joana Fernandes
[Director/ Coordinator]

Porto [PT]

CONTACT

E dgaot.sec@fc.up.pt
W www.fc.up.pt/Satellite_Altimetry
T +351 220 402 452

RESEARCH DOMAIN

Other: Psychology

AFFILIATION

- ISPA - Instituto Universitário

NON-SPACE SECTORS OF ACTIVITY

- Cognition
- Social Cognition and Body Odors
- Health
- Social Development
- Higher Education
- Research

William James Center for Research
at ISPA University Institute

> **Enabling human adaptation in isolated, confined, and extreme work environments.**

ISPA - Instituto Universitário was the first Portuguese University to offer a Psychology degree. It has an integrative and multidisciplinary vision in the study of psychological, social and life sciences, with over 60 full-time faculty members and well-established national and international partnerships with other universities, NGOs, companies and municipalities. The WJCR is funded by the FCT [Excellent rating in the last Multi-Year Funding Program for R&D Units]. It integrates outstanding research from the University of Aveiro and ISPA.

PRODUCTS/ SERVICES

[1] **HD-ICE (ESA – Concordia – Cantisani 14)** examines how individual psychological attributes and team processes influence team interactions during *long* duration space analogue missions.

[2] **ADaT (PROPOLAR 2019-2020 – AdaT)** examines team adaptation to unexpected events that threaten performance and wellbeing during *short* duration space analogue missions.

[3] **POTION (Horizon 2020, Grant Agreement No 824153)** examines how body odours associated with happiness and fear drive social interactions.

[1] Sociometric badges ready for distribution across research participants
[2] Aurora during the winter time at Concordia Research Station
[3] Field observation at King George Island, Antarctica

Ispa
WJCR | William James Center for Research

EST. 2014

Gün R. Semin
[Director/ Coordinator]

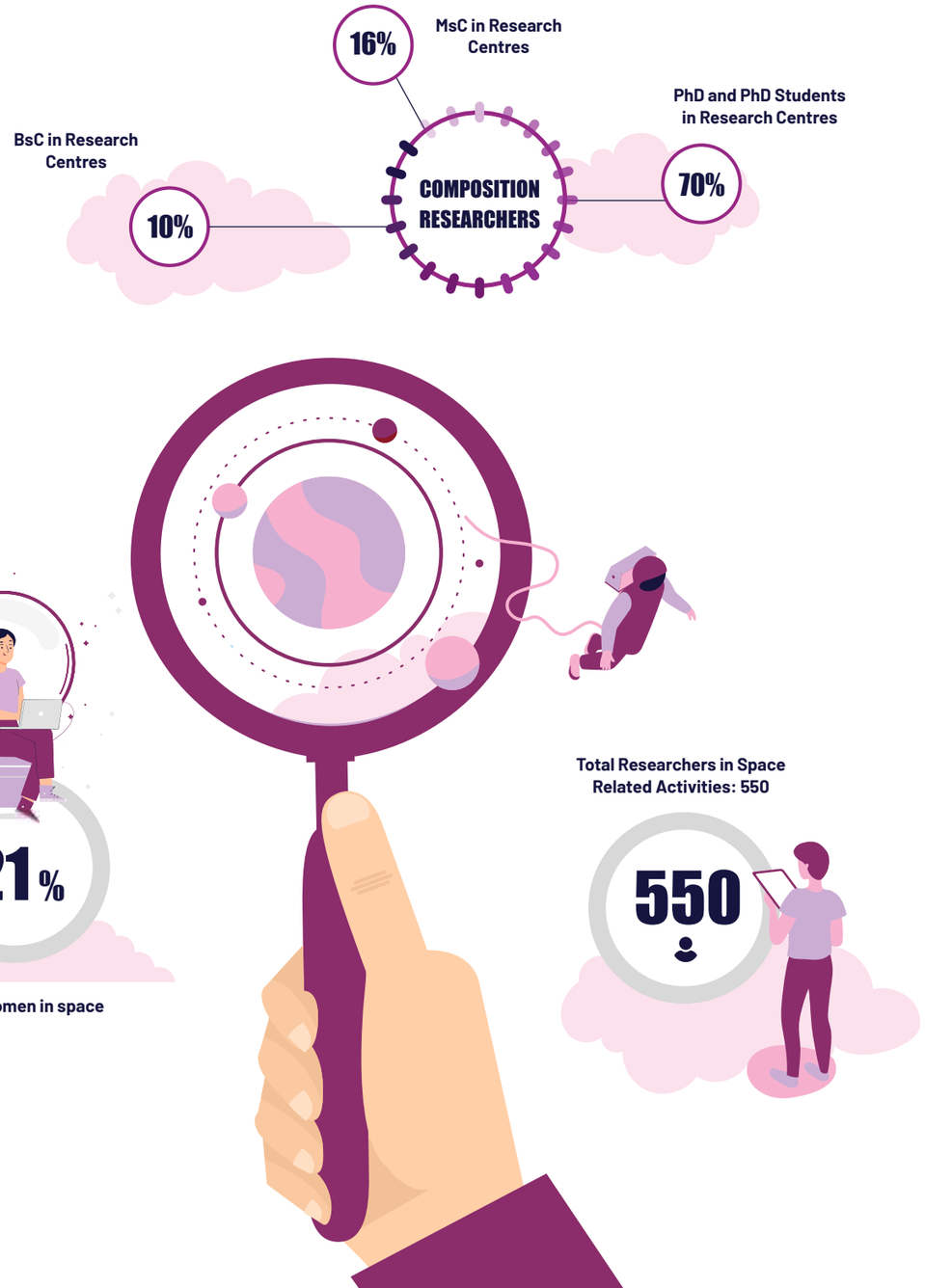
Lisbon [PT]

CONTACT

E wjrc@ispa.pt
W www.williamjamescr.org
T +351 218 811 700

Pedro Quinteiro
pquinteiro@ispa.pt

RESEARCH CENTRES INDICATORS *




View of earth from space. © freepik.com

SPACE LAW

Abreu Advogados

Breaking Space Barriers.

Abreu Advogados is an independent Law Firm that in 25 years grew from 6 to over 300 people by successfully applying a 3Q policy - Technical Quality, Organizational Quality and Human Quality. By breaking barriers from offices to practices, talents and capabilities, we create an ecosystem that brings each project to life. At Abreu there is a team that matches every client. By fostering conversations through a close and clear relationship, we translate legalese to the language you want to speak. By challenging the status quo through a culture of transparency, we are pioneers of gender equality and diversity. By putting the Future into Progress through constant monitoring, we anticipate global changes in minds and markets. At Abreu we have specialists focused on innovation and new technologies. We believe that only by complementing each other will we be able to create synergies; We affirm our heritage through the coherence of our decisions; We act and manage by example; We know that our success depends upon our capacity to innovate and integrate the new technologies into the practice of law; We use all our knowledge to prevent problems or to provide solutions to our Clients; We simply say NO to anyone who wishes to use our services for less ethical purposes; We obtained the ISO 9001:2015 certification so as to impose absolute rigor to our processes and procedures; We are aware of the need to respond quickly to the requests of our Clients; We do not discriminate. Period! We keep the door of our offices always open. Open to dialogue too.

PRODUCTS/ SERVICES

Abreu Advogados is in the frontline of innovation and has a profound know-how on similar areas. In this way, Abreu is ready to take the next step, adapt and gain expertise in order to and provide Space law services. The services to be provided by Abreu Advogados include but may not be limited to:

- Legal advice with respect to space activity licensing, qualifications and regulation;
- Drafting and negotiation of contracts involving space equipment, objects, systems and infrastructures and analysis of the legal framework to be considered for their registration;
- Assistance with all legal matters related with space commercial and transactional activity, notably but not limited to corporate, financial, labor, tax, insurance and litigation matters (including civil responsibility regarding space exploitation, space equipment and all related activities);
- Defence and homeland security & drafting of national and EU policies;
- Analysis of the legal implications and aspects to be observed with respect to the generation of satellite data through space technologies and infrastructures as well as assistance with the procedures required to facilitate and encourage space private activity in Portugal, notably in what respects the coordination and harmonization of the Portuguese legal framework and the international legal regimes.

CERTIFICATION/S:

▶ISO 9001:2015 ▶BCorp ▶IFLR1000

EST. 1993 | Lisbon [PT] | Inês Sequeira Gomes [Managing Partner]

Abreu: advogados

CONTACT

E dbd@abreuadvogados.com
W www.abreuadvogados.com/en
T +351 217 231 800

Nuno Luís Sapateiro [Professional partner]
nuno.sapateiro@abreuadvogados.com

WORLD PRESENCE: Madeira; Angola; Brazil; Cape Verde; China; France; Guinea-Bissau; Italy; Mozambique; Spain; Timor-Leste

CEDIS, at Nova School of Law, Nova University of Lisbon

SPARC promotes capacity building and Portuguese Space Law research & brings a new perspective to academia.

CEDIS – Law & Society Research Center – is the research center of NOVA School of Law, funded by the National Science and Technology Foundation (FCT). Since its creation in 2004, CEDIS has aimed at building a new paradigm for a scientific research on Law, seen in its manifold relations with the wider domain of social sciences and humanities. Currently our research covers various areas of Law as well as History, Anthropology, Sociology, Economics, International Relations, Political Science as well as other kindred areas, with a strong focus on Law in all of the Portuguese Speaking Countries.

PRODUCTS/ SERVICES

One of the research groups/lines of research within CEDIS is the Space Law Research Center [SPARC]. SPARC's purpose is to research and promote awareness on topics related to space law. SPARC covers a wide range of space law topics, either at international, European or national level, from the first steps of space law such as the five UN "space treaties" to contemporary challenges such as space debris or resource exploitation. Particularly, it has a goal to further develop a space law community in Portugal and to write in Portuguese on space law matters, since this is something which is currently lacking in the Portuguese-speaking academia. To this end SPARC organizes courses, workshops and other events, as well as issues space law publications.

CEDIS CENTRO DE I&D SOBRE DIREITO E SOCIEDADE

EST. 2004 Lisbon [PT] Armando Marques Guedes [Director]

CONTACT

E cedis@novalaw.unl.pt
W www.cedis.fd.unl.pt
T +351 213 847 466

Space Law Research Center
project-hybrid@utp.pt

To guarantee a strong competency to supervise, monitor and forecast potentially threatening solar events, ESA is preparing the first ever mission to the L5 Lagrangian point – spot in space where gravitational forces and the orbital motion of the spacecraft, the Sun and Earth interact to create a stable location from which to make observations. This new space weather mission, with the help of Portuguese participation will be a game changer in establishing better forecasting capabilities.

IJP - Portucalense Institute for Legal Research

Developing academic research and training offers in the fields of space law and policy in view of contributing to the overall implementation of the national strategic objectives for the space sector.

At IJP we are currently developing research and training offers in the fields of space law and policy in line with the strategic objectives for the national space sector set out by the Government of Portugal. Space is one of the main components of the research project 'Security in a changing world: hybrid threats, societal resilience and disruptive thinking' directed at furthering research in the fields of Public International Law and International Relations. The main line of our research is devoted to examining the current and potential added value of space-based technologies in view of strengthening societal resilience and government decision-making in the face of hybrid and compounding security threats. Leveraging our international networks, the team is focused on the identification and analysis of present and future trends in space related fields and their intersection with the challenges posed by emerging and disruptive technologies. Overall, one of the objectives of our work at IJP is to contribute to policy creation and implementation, especially in line with Portugal's "National Defence Strategy for Space (2020-2030)".

PRODUCTS/ SERVICES

The Project entitled **'Security in a changing world: hybrid threats, societal resilience and disruptive thinking'** aims to advance research in the fields of Public International Law and International Relations in connection with international security by focusing specifically on the topic of hybrid threats. With a strong component focusing on space, the project aims to identify trends in several domains of human activity and their intersection with space. More specifically it aims to assess the added value of space to **improve societal resilience in the face of hybrid threats.** Disruptive thinking in regard to space is also a component of the project.

EST. 1987 Porto [PT] Wladimir Brito [Director]

IJP INSTITUTO JURÍDICO PORTUCALENSE

CONTACT

E project-hybrid@upt.pt
W www.ijp.upt.pt
T +351 960 264 641

Bruno Reynaud de Sousa
breynaud@direito.uminho.pt

UCILER,
at University of Coimbra

Promoting sustainable use of outer space for the benefit of present and future generations.

University of Coimbra Institute for Legal research [UCILeR] is dedicated to developing interdisciplinary and transdisciplinary research with a science-policy and social engagement. UCILeR research team is composed of about 80 researchers, letting a broad range of subjects covered and to a critical mass that leads to our research excellence. Our goal is to direct our research toward the new societal challenges, including cutting-edge themes, such as robotics, artificial intelligence and techlaw.

PRODUCTS/ SERVICES

[1] **GeoSpatial Intelligence:**
uses and explotation of imagery and geospation information for legal purposes, namely registry, planning, licensing risk management and reporting.

[2] **Earth observation:**
uses of satelite images for territorial justice and mapping of environmental risks and ecosystems services.

[3] **Airspace sovereignty and liability:**
The right to use the low earth orbit area, and State liability for damage caused by space objects and spatial waste.

EST. 2013 Coimbra [PT] José Manuel Aroso Linhares [President]

1 2 9 0
INSTITVTO • IVRIDICO
FACVLDADE DE DIREITO
UNIVERSIDADE D
COIMBRA

CONTACT

E geral@ij.uc.pt
W www.uc.pt/fduc/ij
T +351 239 247 307

Alexandra Aragão
aaragao@fd.uc.pt

Vieira de Almeida & Associados

Challenged by the future.

Vieira de Almeida (VdA) is an international corporate law firm with 40 years of history. Its legal services cover several industries and practice areas. VdA has been recognized for its outstanding and innovative services, having received prestigious legal industry accolades and awards internationally. Through the VdA Legal Partners network, clients have access to 13 jurisdictions, with coverage in all Portuguese-speaking and several French-speaking African countries, and Timor-Leste.

PRODUCTS/ SERVICES

Provision of legal and policy services, including:

Private sector:

[1] Advising on regulatory and compliance issues for developing, testing and deploying space objects and ground stations, including licensing, orbital slots and spectrum as well as issues relating to the use of space technology in several sectors

[2] Drafting and negotiating contracts for development, construction, sale and purchase (satellites, launchers, ground stations), provision of services, among others, including terms of service and privacy policies for digital offers

[3] Assisting on incorporation and financing, from the setting-up of companies to the implementation of business and public partnerships, financing structures and business restructurings, and including financing from public calls and grants, national aid programmes and development banks, business angels, venture capitalists and also assisting on technology matters (software, artificial intelligence, robotics, DLT/ blockchain, augmented and virtual reality), data (collection, processing, sharing and governance), privacy, cybersecurity, intellectual property and insurance

Public sector:

[1] Drafting policies, strategies and laws for space as well as advising on public contracts (administrative contracts, public tenders, pre-contractual proceedings) and negotiating partnerships and memoranda of understanding with governments, institutions, agencies and the private sector

[2] Assisting in devising packages / programmes for supporting the space sector (start-ups, SMEs) (aid, financial assistance) and keeping innovation budgets as well as in space defence related issues

EST. 1997 Lisbon [PT] João Vieira de Almeida [Managing Partner]

VIEIRA DE ALMEIDA

CONTACT

E vieiradealmeida@vda.pt
W www.vda.pt/en
T +351 213 113 400

Magda Cocco [Partner]
mpc@vda.pt

WORLD PRESENCE: Porto [PT]; Angola; Cape Verde; Cameroon; Chad; Congo; Democratic Republic of the Congo; Equatorial Guinea; Gabon; Mozambique; São Tomé and Príncipe; Timor-Leste

SPACE INFRASTRUCTURES

European Shock-Tube for High Enthalpy Research (ESTHER)

The European Shock-Tube for High Enthalpy Research (ESTHER) is a research facility hosted in the premises of IPFN, in the IST Campus of Sacavém and inaugurated on the 24th July 2019. This infrastructure was developed in the scope of three contracts awarded by ESA, and the overall budget included the hosting building funded by IST, which amounts to over 2.5M€
The ESTHER is a double-diaphragm combustion shock tube that will research high-speed shock flows, capable of reaching shock speeds above 10km/s, and a large number of shots per day. This high-performance test facility, unparalleled in the EU, can reproduce the conditions of a spacecraft's entry into a planetary atmosphere at the ground level. This capability is crucial to support the design of the thermal protection system, which is essential for future planetary missions (simulating entries into the atmosphere of Venus, Mars and other planets) and for return missions to Earth.
The facility includes an extensive array of state-of-the-art optical diagnostics, including optical emission and absorption spectroscopy, laser spectroscopy, microwave interferometry and a small computing cluster.

©ESA

© INL

INL Open User Facilities

The International Iberian Nanotechnology Laboratory (INL), located in Braga, was founded by the governments of Portugal and Spain under an international legal framework to perform interdisciplinary research, deploy and articulate nanotechnology for the benefit of society.
The INL offers access to their infrastructure and experts. INL's open user access facilities include clean rooms and full-fledged nanotechnology laboratories dedicated to Nanophotonics & Bioimaging, Micro and Nanofabrication, and Advanced Electron Microscopy.
The user facilities provide support throughout all research and development chains in cleanroom processes (device modelling and design, process integration and device fabrication, packaging and testing) and in advanced microscopy and spectroscopy, X-ray diffraction and scattering techniques, photonics and bioimaging, and magnetic resonance imaging.
INL facilities can contribute to development in Quantum Sensing Technologies, LEDs, solar cells, and micro- and nanofabrication solutions, among many other fields.

© Edisoft

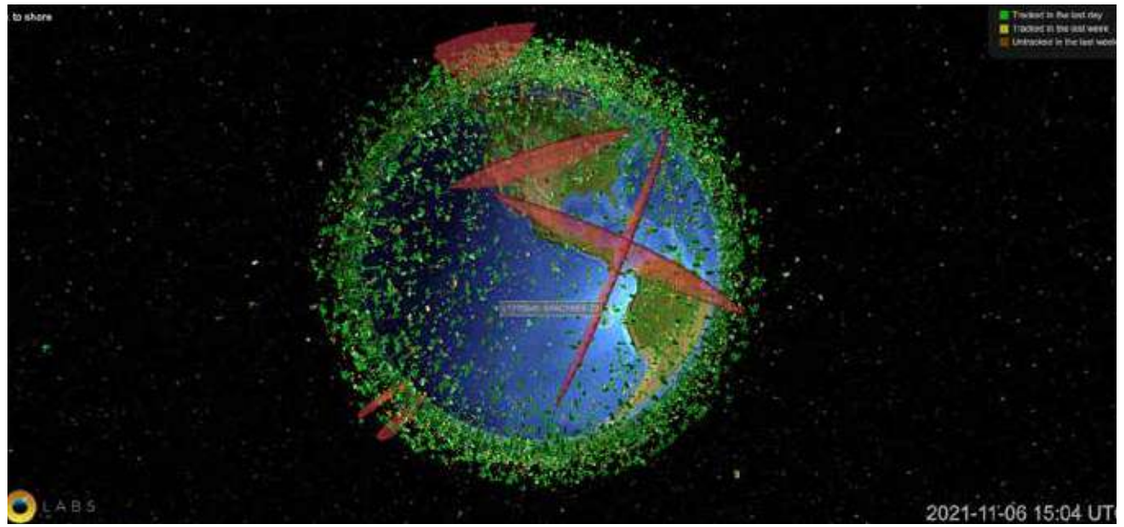
Santa Maria Teleport

Santa Maria Teleport is an important infrastructure located in a geostrategic position and hosting several ground stations crucial for different space missions and services. Its unique location in the middle of the Atlantic is ideal for tracking rockets launched from Europe's Spaceport in Kourou in French Guiana or for hosting space radars.

ESA TRACKING STATION

This S-band and X-band station is part of the European Space Agency ESTRACK and Arianespace network. Consisting of a 5.5m antenna hardwired on a stable concrete platform, telecommunications equipment, a no-break power system, lightning protection, and support infrastructure, it is one of the first ESTRACK stations with launcher tracking capability and is used to receive real-time telemetry from launches originating from Europe's spaceport in Kourou. This tracking station has been used to track Ariane, Vega and Soyuz launches, including 5 ATV missions and 10 Galileo missions.

This tracking station may also support Project CleanSeaNet, managed by the European Maritime Safety Agency (EMSA) and provides satellite detection of oil slicks, and Project MARISS (MARitime Security Service), part of the European Union's Global Monitoring for Environment and Security (GMES) programme and supported by ESA.



GALILEO SENSOR STATION

Santa Maria's Galileo Sensor Station (GSS) is part of a global GSS network required to monitor Galileo's accuracy and signal quality in real time. This network of stations is crucial to precisely determine individual Galileo satellite positions and compute a set of corrections to keep Galileo accurate at all times.
The station consists of a no-break power system, guardhouse, VSAT satellite antennas to provide secure satellite connection to the Galileo Ground Segment and small omnidirectional antennas to monitor the Galileo signals.

EUMETSAT EPS-SG GROUND STATION

The EUMETSAT Ground Station integrates the terrestrial infrastructure of the European Organization for the Exploitation of Meteorological Satellites (EUMETSAT), to support the operation of European weather satellites. The radome protected X-band antenna receives data from EUMETSAT polar orbital stateless supporting weather, climate and environment monitoring.

LEOLABS SPACE RADAR

The Azores Space Radar will become operational in the first half of 2022 and is part of LeoLabs global constellation of LEO Sensors. This multi-decade investment will improve LEO objects tracking capability by an additional 25%. This will contribute to a grow in the LEO catalogue to 250000 tracked objects and add more timely updates on critical events in LEO, including collisions, breakups, maneuvers, new launches, and re-entries.

15M ANTENNA

Santa Maria's 15m antenna supports S-band and X-band telemetry acquisition and telecommand uplink, with performance similar to 15m ESTRACK ground stations.
This infrastructure was initially deployed in Perth, Australia, as part of the ESA ESTRACK network. Following its decommission due to radio spectrum limitations, Portugal acquired this antenna and deployed it in Santa Maria, where it can continue to be used to explore commercial and scientific opportunities, having the capability to reach deep space.

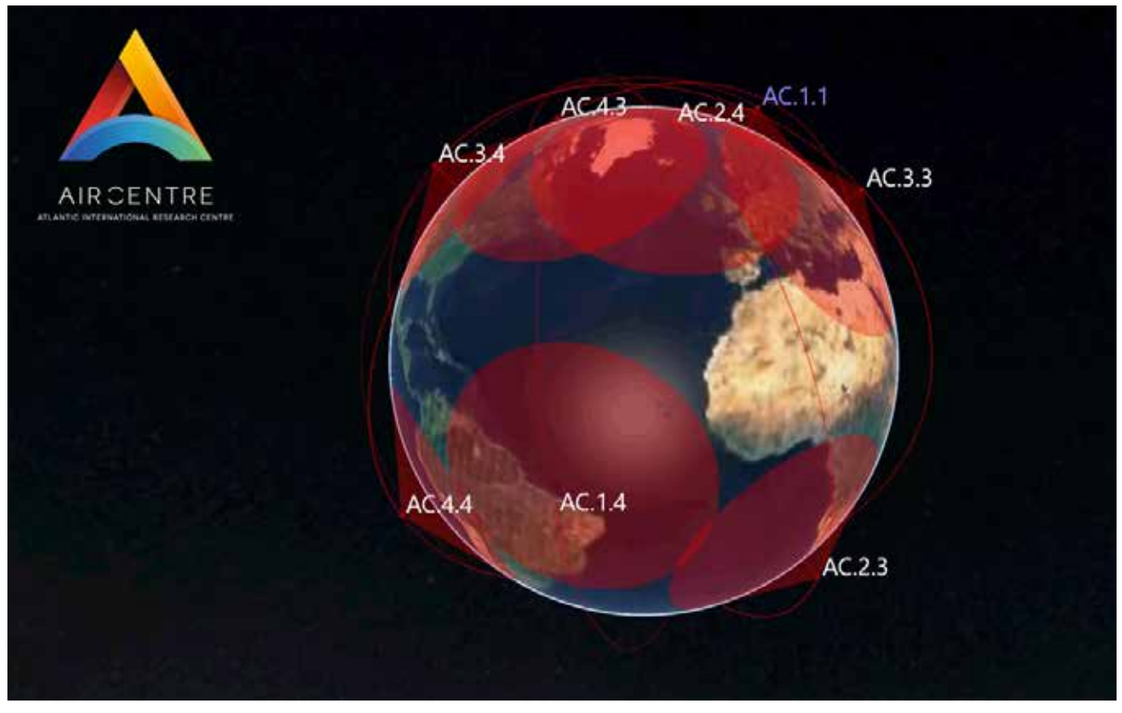
RAEGE Santa Maria Station

The RAEGE station, on Santa Maria Island in the Azores, is dedicated to Very Long Baseline Interferometry (VLBI). VLBI is based on the observation of a celestial object simultaneously with a set of widely distributed radio telescopes, measuring the delay in the reception of the radiation from the selected object at each telescope to assess very precise variation in the relative position of the different telescopes. These observations allow the accurate determination of the terrestrial reference frame, the celestial reference frame and Earth's orientation in space.
Santa Maria's RAEGE station has a 13.2m radio telescope, equipped with a tri-band receiver (S, X and Ka). The station also includes two permanent GNSS stations integrated in the International (IGS), European (EUREF) and Azorean (REPRAA) regional networks, a no-break power supply and the control building which houses gravimeters and seismographs and a hydrogen maser atomic clock.

ESA_LAB @ Azores - AIR Centre EO Labs

Earth Observation Laboratory (EO Lab), established as an ESA_LAB @Azores aims to create an institutional link between research entities andthe European Space Agency (ESA) to explore innovative applications basedon technologies and space observation systems in the Atlantic area. TheEO Lab is currently, also preparing important upgrades of its infrastructurefor high-speed internet access, data storage and processing and satellitedata reception, allowing to create the backbone of future services that areto be provided by the AIR Centre.PRODUCTS/ SERVICESMore than 20 ongoing projects in diverse areas such as marine litterdetection from space (LABPLAS, HYPERSPECTRAL), EO based fisheriesand aquaculture services (NEXTOCEAN), support systems for agriculturemanagement (SAP), space enabled sustainable port services (PORT XXI), program for Copernicus market uptake (FPA-CUP), satellite constellation-development studies (ATON, AEROS, MAGAL), among others.

The ESA_LAB @ Azores is part of the Portuguese Roadmap of Research Infrastructures of Strategic Relevance.



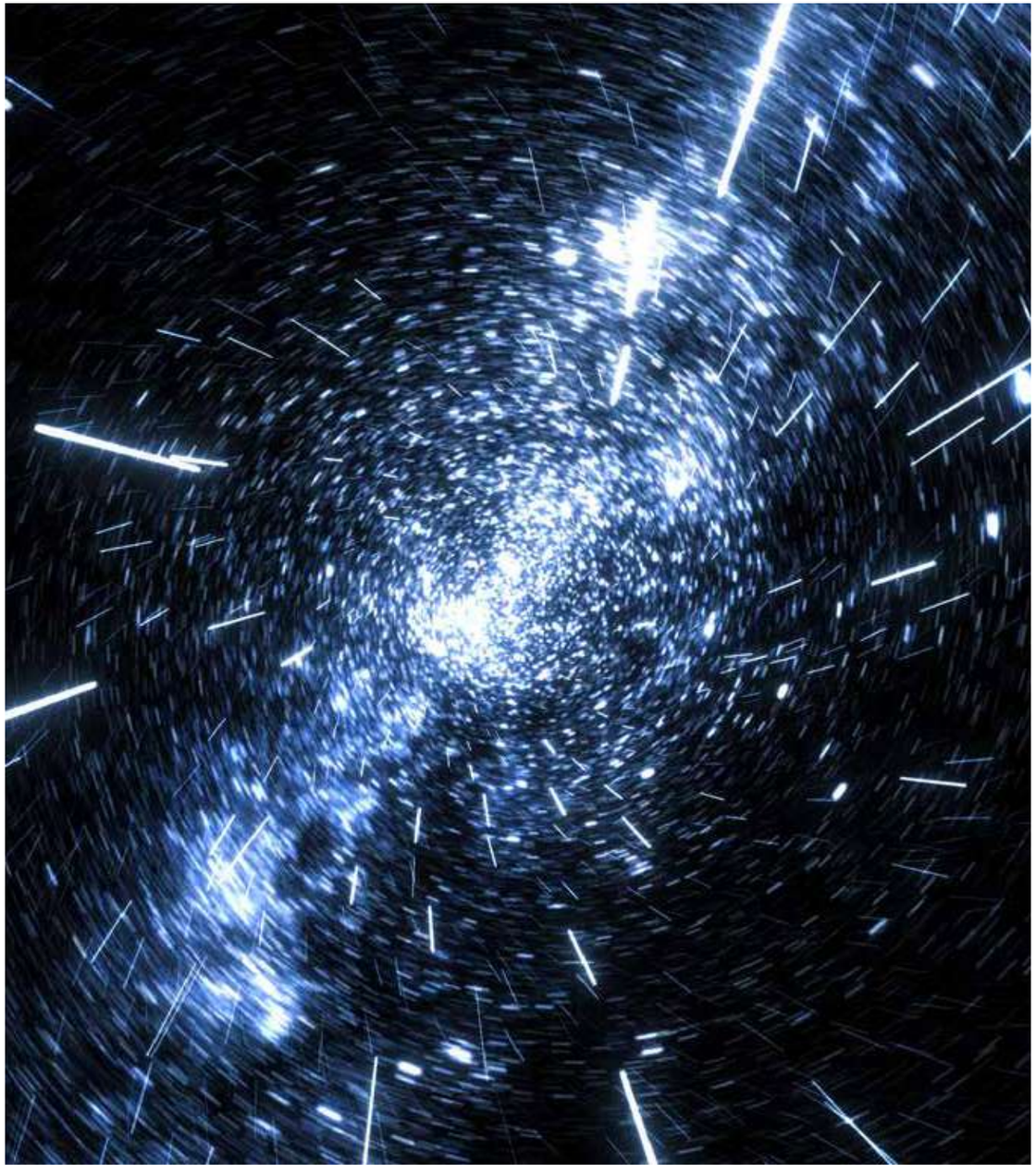
Advanced Computing in Portugal

The National Network for Advanced Computing (RNCA) is a collaborative platform, managed by the Fundação para a Ciência e Tecnologia (FCT). Its mission is to provide advanced computing services to the research, technology, innovation and industry communities in Portugal. RNCA is composed by four operational centers and a set of competence centers.
The BOB and DEUCALION supercomputers are installed in Riba de Ave, Braga, at the Minho Advanced Computing Center (MACC). It is a national collaborative infrastructure that supports Open Science initiatives in supercomputing, data science and visualization.

In the Laboratório de Computação da Universidade de Coimbra (LAB-UC) you can find the Navigator/ Navigator+ supercomputer. This is a infrastructure that was founded with the main goal of providing high-performance computing resources and services. LAB-UC is a member of PRACE – Partnership for Advanced Computing in Europe.
At the High Performance Computing of Universidade de Évora (HPC-UÉ) is installed the Oblivion supercomputer, which was acquired to support the processing of massive volumes of data (Petabytes). The Vision supercomputer is expected to arrive to this facility in 2022.

INCD (Infrastrutura Nacional de Computação Distribuída), in Lisbon, is also part of the RNCA. This is a digital support infrastructure for research purposes. It provides computing and storage services to the national scientific and academic community and is specially designed to provide scientific calculation services.

© RNCA



Processing the vast quantities of data produced by the SKA will require two very high-performance central supercomputers along with the distributed computing capabilities of the SKA Regional Centre network. © SKA Organisation/Swinburne Astronomy Productions. SKA Organisation/Swinburne Astronomy Productions.

Space Rider aims to provide Europe with an affordable, independent, reusable end-to-end integrated space transportation system for routine access and return from low orbit. It will be used to transport payloads for an array of applications, orbit altitudes and inclinations.
© ESA - J. Huart

Santa Cruz Airfield

The Santa Cruz Airfield is a small airfield in Torres Vedras. It is the most westerly airfield in mainland Europe. This airport has a 609m length runway and a fully equipped air operational control room.
Santa Cruz is the base airport of Aeroclube de Torres Vedras. Since its creation in 1946, it has promoted several aeronautical activities, including Classic Aviation, Aeromodelism, Gliders, Experimental Rockets, Hang Gliding, Ultralights, Paragliding and Motorgliders. This airport also hosted the 2015 and 2016 European CANSAT final.

© RAEGE

© RAEGE

© RAEGE

Ponte de Sor Airfield

The Ponte de Sor Airfield is a public infrastructure for public use, certified by the National Civil Aviation Institute (INAC) in class II, Code 3C and Category 3, in the scope of Rescue and Fire Fighting. The runway with 1800m length has AFIS service, the possibility of performing night flights and a support system for landing by instrumentation - ILS (Instrument Landing System), in the latter in the cerficiation phase. Aircraft up to the Airbus A320 or Boeing 737 (inclusive) can operate here.
It is an important infrastructure for aeronautical companies, providing supporting facilities that improve business competitiveness. Several entities are hosted in this airport, including the National Civil Protection aerial fleet headquarters, L3Harris Airline Academy, GFS | Global Flight School, and Tekever. This airport's Aeronautical Campus supports R&D activities and has established partnerships with different higher educations institutions.
The Portugal Air Summit is also hosted at Aeródromo Municipal de Ponte de Sor.

Alfouvar Satellite Centre

Alfouvar Satellite Centre is located near Sintra and has 60 antennas, including two antennas with 32 m diameter. This Satellite Centre ensures connections with six different satellite constellations, and each antenna is dedicated to a single satellite. It manages TV broadcasts, internet connections and voice services. The Satellite Centre can also work as a backup telecommunication infrastructure, providing connectivity when terrestrial networks are offline.

© RAEGE

Santa Margarida Military Camp

The Santa Margarida Military Camp (CMSM) MHC is a Portuguese Army's military base and instruction area. CMSM is located in Santa Margarida da Coutada, in the municipality of Constância, and is one of the largest military installations in Europe, as well as the largest Portuguese military installation in terms of the garrison and the second largest in terms of the occupied area. Its 6400 ha of occupied area includes a runaway, two heliports, and several shooting ranges.
The CMSM heavy vehicle shooting range hosted the 2021-edition of the European Rocketry Challenge EuRoC for university-level student teams.

© DEIMOS

Space Surveillance and Tracking (SST-PT)

Portuguese MoD

Continued space exploration and the increasing use of satellites has resulted in a growing number of objects in orbits surrounding the Earth, many of them without known orbits. The presence of these objects in orbits occupied by satellites, that are vital to our way of life, represents a serious risk to their integrity. Any collision, at that speed, results in the total or partial destruction of any infrastructure it collides, as well as the creation of new debris.

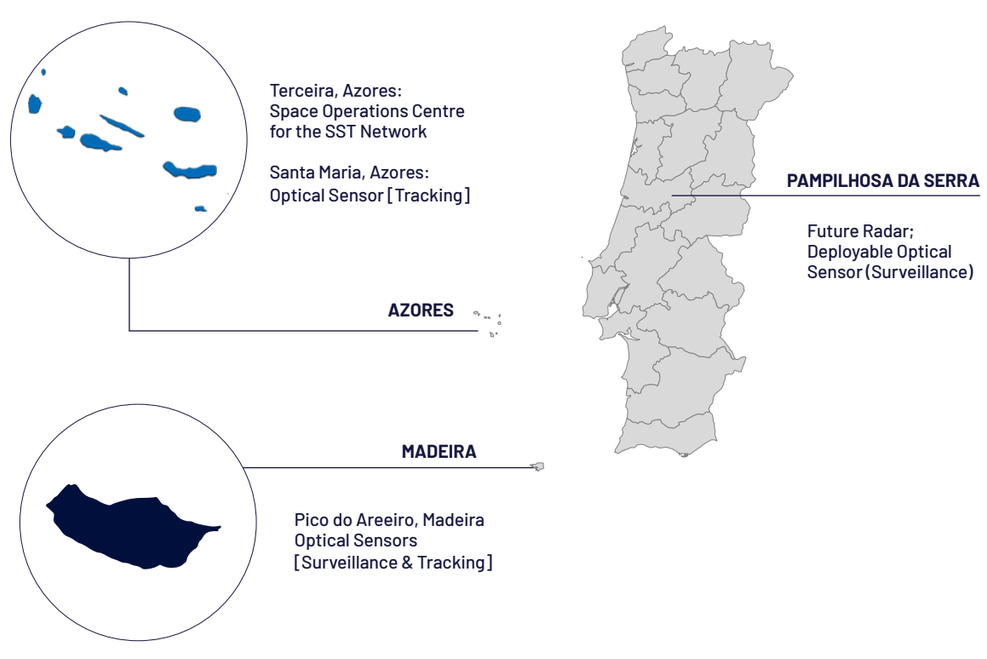
With this in mind, the European Union (EU) established, in 2014, the creation of the European Space Surveillance and Tracking (SST) Program.

In 2017, Portugal applied to the EU-SST Consortium and the SST Project Group (GPSST) - an inter-ministerial group led by the Portuguese MoD - was created, with the mission of preparing, implementing and operationalizing the national SST capacity of a civil-military nature.

As a result, in 2018, Portugal's application was accepted, the Agreement was signed and Portugal became officially part of EU-SST Program.

Portugal sought, from the outset, to build a national SST capacity that would be relevant to the European network. The Azores and the Madeira Islands represent a privileged location for the development of activities in the space sector, requiring a close articulation between the GRA, GRM, the Government, the National Agency for Space, the national companies present in this sector and the scientific community.

In October of 2020 the first milestone of the SST Project, was reached by putting into operation, the first national telescope, AzoresTel1-S, on the Azorean island of Terceira, where the Space Operations Centre (COpE) will also function, formally marking the beginning of the operational activity of the SST. After that the Portuguese SST Project has accepted 3 more Telescopes (2 in Pico de Areeiro and 1 in Pampilhosa da Serra), of which one has the mobile capability to be placed and operated in anywhere in the world. Another addition to the SST Network, in collaboration with Telecommunications Institute and Aveiro's University, is currently in development, a Radar that will allow to track objects in Lower Earth Orbits (LEO) and to expand the Situational Awareness of what is orbiting our Earth, what treats it may cause to our Satellites and Infrastructures. It is the combination and sharing of capacities to the EU, that already exist (or are in development) in each country, that serves Europe's strategic interests in terms of space security.



PORTUGAL PRESENCE IN INTERNATIONAL ORGANIZATIONS

ESA

EUROPEAN SPACE AGENCY

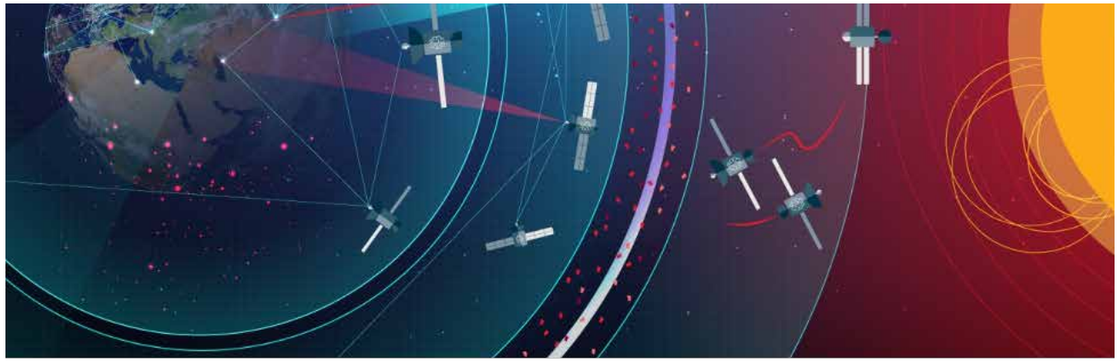
Portugal is a full member of the European Space Agency (ESA) since November 2000, when it became the 15th member of the intergovernmental organisation. By that time, the country was already involved in some of ESA's optional programmes, namely in the field of satellite navigation, through a bilateral agreement signed in 1996.

For 45 years, ESA has been outlining and executing the European space programme, focusing on finding out more about Earth, its space environment, our solar system and the universe. Concentrated on the development of satellite-based technologies and services, the European Space Agency also works in the promotion of European industries and the wider space ecosystem through its industrial policy.

The 22 member states endorsed, in November 2019, the most ambitious plan in the history of ESA, accounting for 14.4 billion euros over five years. The Portuguese contribution has also increased significantly from 73 million euros subscribed in 2016 to 102 million for the next years.

Portugal is engaged in several of ESA's Programmes, namely Earth Observation, Space Situational Awareness, Telecommunications, Navigation, Space Transportation, Space Exploration and Technology Support. In addition to the strong Portuguese engagement in the optional programmes there are also the Mandatory Activities, including the Basic Activities, the Scientific Programme and the Guiana Space Centre.

© ESA



© ESA

ESA Agenda 2025 and Accelerators

For the past 20 years Portugal has been an active Member State of the European Space Agency (ESA), leveraging its contribution and participation in ESA programmes through the growth of the national space community, while more recently by assuming, together with France, the presidency of the ministerial council of ESA. Portugal has thus welcomed and embraced the new ESA Agenda 2025, which sets the priorities of ESA Director General for the coming years, namely:

- Strengthen ESA–EU relations;
- Boost green and digital commercialization;
- Develop space for safety and security;
- Address critical programme challenges;
- Complete the ESA transformation.

These priorities are deemed paramount for Europe to benefit from space as significantly as the US and China, through a common European space vision and ambition, building upon existing expertise, knowhow, and industrial capacity, throughout all ESA Member States.
Within this context, the ESA Director General called a group of independent, high-level advisors to assess the economic, societal and political role of space in an evolving global context and against emerging challenges and to advise on ways to accelerate the use of space in Europe. Amongst the main conclusions, three priority streams replying to urgent societal challenges have been identified for immediate action through Accelerators, namely as per the report:

- ACCELERATOR 1 - RAPID AND RESILIENT CRISIS RESPONSE, enabling security stakeholders to ensure rapid provision of information, and quick response to climate-induced and other crises facing Europe;
- ACCELERATOR 2 - SPACE FOR A GREEN FUTURE, using advanced space data, science & technology for sustainable life on Earth, and support society and decision makers to reach carbon neutrality by 2050;
- ACCELERATOR 3 - PROTECTION OF SPACE ASSETS, to ensure resilient availability and functioning of space infrastructure on which Europe's economy and society relies for day-to-day life.

The New ESA Agenda 2025 and Accelerators are set to drive the short to medium term development of the European Space sector in the context of the current global challenges. Portugal shall continue its contribution to shape an ambitious and inclusive European common approach, driven by the development and positioning of the Portuguese space community in European and global space value chains, with the enduring support and promotion of Portugal Space and its stakeholders.

Portuguese Subscription to ESA 19+

In the 2019 ESA Ministerial Meeting that took place in Seville, Portugal increased nearly 40% its contribution to ESA programmes reaching a total amount of over 100M€ in CM19, when comparing to CM16.

The Portuguese contribution was split in 47M€ in mandatory programmes which correspond to Basic Activities of ESA and the Science Programme and the remaining subscription, over 50M€, in Optional Programmes. For these Optional Programmes, the Portuguese subscription was based on the principles and priorities outlined in the National Space Strategy investing both in programmes that are 100% publicly funded and also in co-funded programmes, which are closer to market and have a commercial focus. As per the priorities the following programmes stood out in absolute subscription terms: 1) Earth Observation, 2) Space Safety, 3) Telecommunications.

For Earth Observation, Portugal significantly subscribed the Copernicus Segment 4 programme which allowed the country to receive nearly 10M€ of industrial contracts. The country also subscribed the Future EO programme, the InCubed+ programme, the Global Development Assistance (GDA) programme and the Arctic Weather Satellite Programme.

For Space Safety the major contribution of Portugal was for ADRIOS, a forthcoming mission for active debris removal, which allowed two Portuguese companies to become sub-system leaders. The Portuguese participation was also reflected on Hera for planetary protection, Lagrange mission on Space Weather and for CREAM for collision avoidance.

As per Telecommunications, Portugal invested in different programmes, including ARTES BASS, being the one with the highest contribution, which supports downstream projects as well as ESA Space Solutions Portugal (ESA BIC and support activities). Portugal also invested significantly in Space for 5G, Space Systems for Safety and Security and in Optical Communications.

Concerning Navigation, the Portuguese contribution was focused on NAVISP Element 2, which is oriented to support market supported activities.

As per Space Transportation the focus was on Space Rider which allowed the participation of Portuguese entities in the development of the reusable orbital vehicle, as well as on Commercial Space Transportation Systems (CSTS), fostering the development of projects in the commercial launcher side.

As per GSTP the Portuguese contribution is focused on ensuring the capacity building on key space technologies and building blocks, as a baseline to achieve full system development capabilities, both at satellite, launcher and ground segment level.

On the scientific side, beside the above-mentioned Basic Activities, Portugal also subscribed PRODEX to support the participation of Portugal in the development of payloads to ESA scientific missions.

Finally, Portugal also contributed to the European Exploration Envelope Programme (E3P) to enable and foster the participation of Portuguese industry and academia to specific projects and missions to the ISS, the Moon and Mars.

ESO

EUROPEAN SOUTHERN OBSERVATORY

The European Southern Observatory (ESO) is an intergovernmental organisation with 16 Member States along with the host state of Chile and with Australia as a strategic partner. Since its creation in 1962 until today, ESO continues to be committed to fulfilling its original mission of providing state-of-the-art research facilities to astronomers and astrophysicists, allowing them to conduct front-line science in the best conditions and to foster cooperation in astronomy.

The ESO Headquarters (comprising the scientific, technical, and administrative centre of the organisation) are located in Garching near Munich, Germany. In Chile, ESO operates the Vitacura centre and three state-of-the-art observing sites: La Silla, Paranal, and APEX. ESO represents its Member States in Atacama Large Millimeter Array (ALMA), a large array of 66 antennas, built and operated in partnership with North America and East Asia and in cooperation with the Republic of Chile.

ESO is building the 39-meter Extremely Large Telescope, the ELT, which will become "the world's biggest eye on the sky" by the end of this decade.

The annual Member State contributions to ESO are approximately 300 million euros (including the contributions to the Extremely Large Telescope), and ESO employs around 700 staff members. Portugal is an ESO Member State since 2000 and currently contributes 1.2% of ESO's annual revenue, amounting for around 2.7 million euros.

Portugal has a solid track-record in science and participation in instrumental projects for ESO facilities.

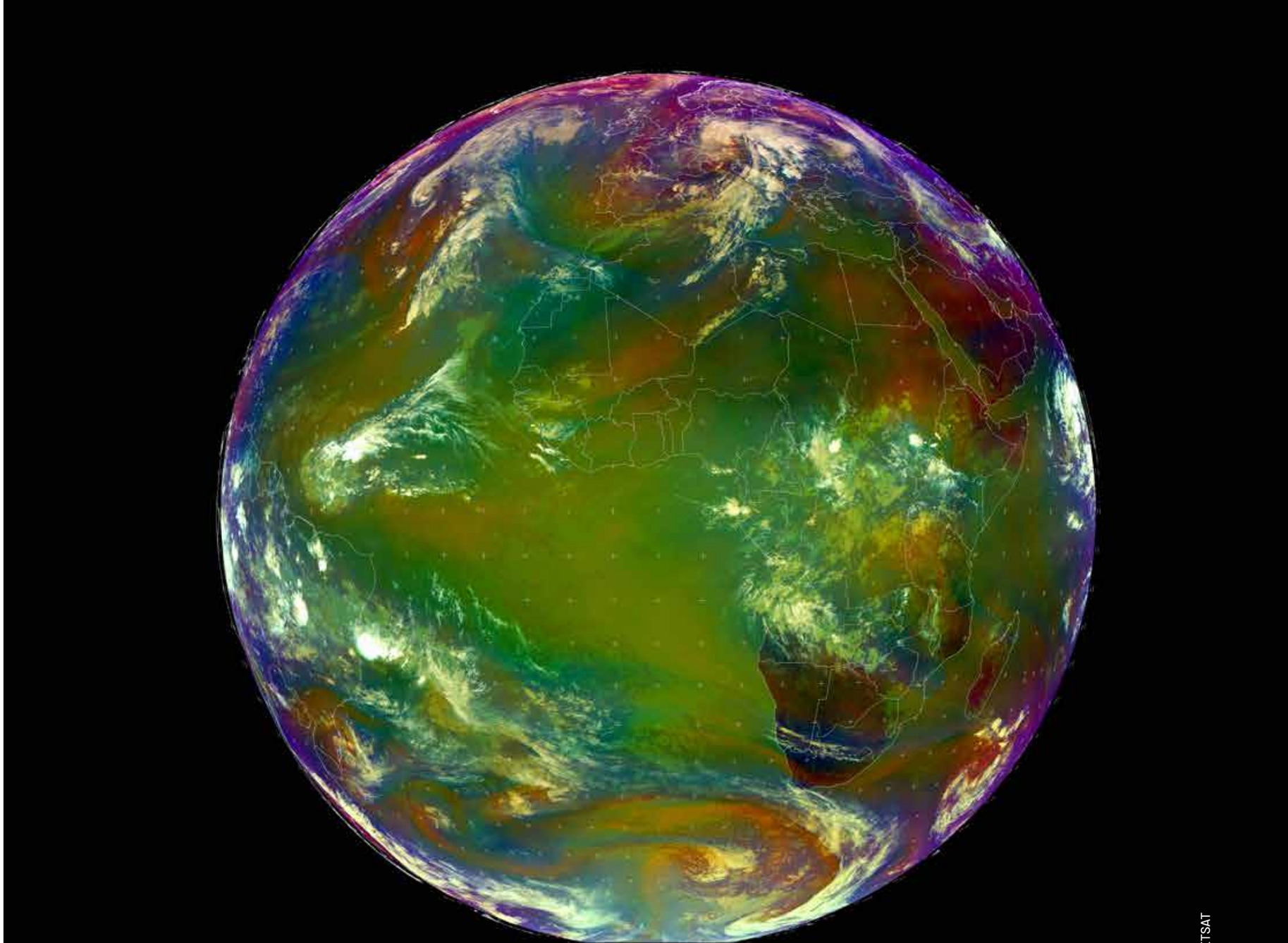
© Y. Beletsky (LCO)/ESO

EUMETSAT

EXPLOITATION OF METEOROLOGICAL SATELLITES

The European Organization for the Exploitation of Meteorological Satellites (EUMETSAT) is the European operational satellite agency for monitoring weather, climate and the environment from space. The organization, based in Darmstadt, Germany, currently has 30 Member States and operates the Meteosat geostationary satellites, the Metop Polar-Orbiting satellites as part of the Initial Joint Polar System shared with the US NOAA, and is also a partner of the Jason missions. Within the Copernicus Programme, EUMETSAT was entrusted by the European Union to operate and deliver data from Sentinel-3 and Sentinel-6 to deliver marine service, and will also operate and deliver products from the Sentinel-4 and Sentinel-5 instruments.

Portugal is Member of EUMETSAT since 1989 and the national participation is managed by the Portuguese Institute for Sea and Atmosphere (IPMA). Furthermore, besides benefiting from the products and data provided by the organization, Portugal hosts a a EUMETSAT Polar System-Second Generation (EPS-SG) ground station in Santa Maria, Azores and the LSA SAF (Satellite Application Facility on Land Surface Analysis) as part of the distributed EUMETSAT Application Ground Segment.



SKAO

Square Kilometer Array Observatory

The Square Kilometer Array Observatory (SKAO) is an inter-governmental organisation whose mission is to build and operate cutting-edge radio telescopes to transform our understanding of the Universe and deliver benefits to society through global collaboration and innovation.

Portugal is one of the founding members of the SKAO and the Portuguese Space Agency is the national representative on the SKAO Council. Organisations from other fifteen countries are currently participating in the SKA at the government or national-coordination level or are represented as observers.

Headquartered in the UK, its two telescope arrays will be constructed in Australia and South Africa to be the two most advanced radio telescope networks on Earth. A later expansion is envisioned in both countries and other African partner countries. The SKAO construction officially started on July 1, 2021. The Observatory is expected to start operations by 2029.

The SKAO's telescopes will explore the unknown frontiers of science and deepen our understanding of key processes, including the formation and evolution of galaxies, fundamental physics in extreme environments, and the origins of life.

Through the development of innovative technologies and its contribution to addressing societal challenges, the SKAO will play its part to contribute to the United Nations' Sustainable Development Goals and deliver significant benefits across its membership and beyond.

© SKA Observatory

EUROPEAN UNION PROGRAMS

EUROPEAN UNION

The European Union (EU) defined six main priorities for the period 2019-2024 which framed the different funding programmes: the European Green Deal, a Europe fit for the digital age, an economy that works for people, a stronger Europe in the world, promoting our European way of life, and a new push for European democracy.
In Portugal, the PERIN - Portugal in Europe Research and Innovation Network - was established to double the national participation in European Union funding Programmes, attract two billion euros for Research and Innovation and to triple the number of students in the field of mobility in Higher Education during the 2021-2027 programming period. This network aims to mobilize and effectively articulate different funding sources by coordinating the separate national entities responsible for the European Union programmes on Research and Innovation, Higher Education, Space and Digital. PERIN is composed of the following national institutions: Fundação para a Ciência e a Tecnologia (FCT), Agência Nacional de Inovação (ANI), Agência Nacional para a Cultura Científica e Tecnológica (Ciência Viva), Agência Espacial Portuguesa (Portugal Space), Agência de Investigação Clínica e Inovação Biomédica (AICIB), Direção-Geral do Ensino Superior (DGES) and Agência Nacional Erasmus+ Educação e Formação.
The EU Space Programme and Horizon Europe are the two main EU centralized programmes that fund Space related activities. However, synergies with other programmes, such as the Digital Europe Programme (DEP), are essential. This is complemented by de-centralized programmes such as Structural and Investment Funds and the Recovery and Resilience Plan which should leverage space-related activities.

© Copernicus

EU Space Programme

The EU has a long track record of defining and managing space activities for the benefit of society. The Copernicus and the Galileo/EGNOS flagship programmes have put Europe at the forefront of Earth Observation and GNSS technologies. They are enable many daily activities that benefit society at a European and Global scale, and that would not be possible without those invaluable assets.
In 2021, the EU Space Programme was officially established with a budget of nearly 14.800 million Euros for 2021-2027. The EU Space Programme supports operations and the evolution of both Copernicus and EGNSS, along with two new components: Space Situational Awareness (SSA) and Govsatcom (Governmental Secure Communications), besides key transversal areas such as security, access to Space and entrepreneurship.
Portugal has been strengthening its role in the EU Space Programme and contributes significantly both in the upstream part (e.g. with the development of components for Copernicus Sentinel satellites) as well as in the Ground Segment part with different infrastructures operational in the Teleport of Santa Maria, Azores. Ultimately, during the last years, Portugal has been developing a robust and mature downstream ecosystem that relies on public and private Earth Observation and GNSS data, offering high added value services to different socio-economic sectors.

EUSPA

The EU Agency for the Space Programme (EUSPA), based in Prague and formerly known as the European GNSS Agency (GSA), is the newly created user-oriented and operational Agency for the implementation of the EU Space Programme, which is coordinated by Portugal Space at national level.
EUSPA has the goal to provide long-term state-of-the-art safe and secure Galileo and EGNOS positioning, navigation and timing services and cost-effective satellite communication services for Govsatcom; communication; promote and develop the market for data, information and services offered by Galileo; EGNOS; Copernicus and Govsatcom; support Public Regulated Service (PRS) usage across the EU; implement and monitor the security of the EU Space Programme; contribute to fostering a competitive European industry for EGNSS and Govsatcom, reinforcing the autonomy; contribute to maximizing the socio-economic benefits of the EU Space Programme by promoting the development of the downstream ecosystem, leveraging Horizon Europe and other EU funding sources, and contribute to fostering the development of a broader European space ecosystem, with a particular focus on innovation and entrepreneurship.

EUSST

The EUSST (EU Space Surveillance and Tracking) is a consortium composed of seven EU Member States (France, Germany, Italy, Poland, Portugal, Romania and Spain). Together with the EU Satellite Centre (SatCen), they have worked to develop a European SST capability forming the SST Cooperation. The Consortium's Member States have networked their assets to provide, through the SST Service Provision Portal operated by SatCen, a set of SST services to all EU countries, EU institutions, spacecraft owners and operators, and civil protection authorities. These services include the assessment of the risk of in-orbit collisions and uncontrolled re-entry of space debris into Earth's atmosphere, as well as the detection and characterization of in-orbit fragmentations. It is expected that a EUSST partnership will be established in the coming years integrating the SSA component of the EU Space Programme.
Portugal is represented at EUSST by the Ministry of Defence and contributes with different ground infrastructures and control centres located on Madeira, Azores and mainland Portugal.

EMSA

The European Maritime Safety Agency (EMSA), founded in 2002 and based in Lisbon, provides technical expertise and operational assistance to improve maritime safety, pollution preparedness and response and maritime security. EMSA provides governments and authorities with detailed, reliable knowledge about what happens at sea, in real-time, to help them implement maritime policies effectively. EMSA also offers maritime services that respond to diverse maritime users' changing needs across Europe, including vessel reporting, Earth Observation, integrated maritime information, pollution response, and port state control.

Besides being the host country of EMSA, Portugal directly contributes to many of the activities of the Agency, including the CleanSeaNet initiative through which Edisoft detects oil spills in near real-time, leveraging the operations of the ESA/SMA station.

HORIZON EUROPE

Horizon Europe (HE) is the EU Framework Programme for Research and Innovation, for the period 2021-2027, with a budget of 95.500 million euros. The programme builds upon Horizon 2020, adding new elements such as the European Innovation Council to support investments in SMEs, five nissions to solve big global challenges, a new open science policy and a new approach to partnerships, legally constituted public-private, or all-public, consortia doing collaborative R&D in specific sectors. HE offers many opportunities for research in relevant areas directly related to Space, such as Space competitive systems, in-orbit demonstration and validation, Space transportation, downstream applications, or the evolution of the components of the European Space Programme. Moreover, the programme also offers many possibilities for research in initiatives that utilize space assets to benefit other areas such as environment, climate, maritime or security applications.

In Horizon 2020, Portugal received over 19 million euros in space related calls and in addition to another nearly 10 million euros in non-space related calls that funded Space associated activities.

For HE, the Portuguese Space Agency, in close collaboration with the PERIN, has taken over the role of Delegation and National Contact Point for Space-related topics to increase the participation in Space related topics and foster synergies between different Space associated institutions and programmes.

Portugal from space © Thomas Pesquet, ESA/NASA

SPACE CULTURE, EDUCATION AND CHALLENGES

SSP22 organized by Portugal Space with IST, in Oeiras

Space Studies Program 2022 – Oeiras, Portugal

The Portuguese Space Agency and Instituto Superior Técnico are organising between June and August 2022 the Space Studies Programme (SSP22). The SSP is an intensive nine-week course that will bring together in Portugal around three hundred students, teachers and specialists from the Space sector at a global level, namely from ESA, NASA and other space agencies, as well as figures from the major world players of the space sector.

The SSP is promoted by the International Space University (ISU) that annually awards the organization of the course to a candidate country. The winning proposal from Portugal Space and IST foresees the organization of the SSP in IST's Taguspark campus, in Oeiras.

The realization of the SSP is in line with the implementation of the Portugal Space 2030 strategy, as it places the Portuguese Space Agency as a promoter of opportunities associated with education and capacity building in the space sector, contributing to create the critical mass necessary for the sustainable development of the multidisciplinary space sector in Portugal. At the same time, hosting SSP22 is to have a live show-case of national capabilities, promoting the creation of collaborations and opportunities in the space sector by bringing Portuguese industry and academia closer to the main international agencies and world industry. The SSP22 edition is targeting Earth observation, the ocean, climate change and the relations between the space and non-space sectors, promoting synergies between the two.

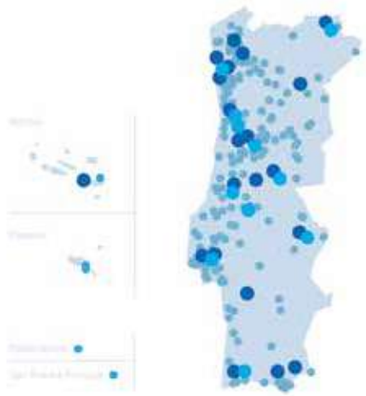
PORTUGAL SPACE PHD SCHOLARSHIPS

Through an agreement with the Portuguese Science and Technology Foundation (FCT), the Portuguese Space Agency manages the calls to grant twenty scholarships per year until 2023 in all areas related to space. In 2020 and 2021, calls on Space Sciences and Exploration, Earth Observation, Space Safety have been launched with more to come.

PORTUGAL SPACE SUMMER SCHOOLS

The Portuguese Space Agency has promoted and will continue to promote summer schools for university students, targeting a variety of space related areas. The goal is to develop interest and knowledge in specific space subjects, within space sciences and exploration, space safety, Earth Observation, among others, while promoting interaction with academia and industry.

Space Science for All



Ciência Viva, the Portuguese Agency for Scientific and Technological Culture, was created in 1996 to promote scientific culture and science education. The Agency is an association of public bodies and research institutions and develops its activities through networks across the country: a network of Ciência Viva Centres; a network of Ciência Viva Schools (museum schools combining formal and non formal education); and a network of 238 Ciência Viva Science Clubs at Schools.

Ciência Viva organizes a Science and Technology Week, a national campaign of science activities in the summer for the general public (Ciência Viva in the summer), the National Day of Scientists, and other initiatives to engage citizens with science.

The Pavilion of Knowledge – Ciência Viva Centre, in Lisbon, the headquarters of the agency, regularly includes space activities in its education and outreach programmes, which extend to the Lisbon Metropolitan area. Space food, astronomy and the solar system, coding and robotics, planetary geology, and parachute aerodynamics are some to the topics currently included in these activities that reach out to thousands of students. Lectures and conferences with space researchers, space launches commented by scientists, and exhibitions related to space exploration are among the most popular initiatives of the programming of the Pavilion. Hands-on activities related with space are common in events for families, and in the summer the Network of Ciência Viva Centres organizes astronomy observations all over the country.

Ciência Viva hosts the Portuguese European Space Education Resource Office (ESERO Portugal), an educational programme supported by ESA. ESERO Portugal takes on space as an inspiring context for learning science, technology and mathematics, to promote the students' interest in these subjects and encourage them to pursue space careers.

ESERO Portugal creates space education resources and projects, organizes teacher development courses deployed at national level in collaboration with the Network of Ciência Viva Centres, and actively promotes ESA school projects.

ESERO Portugal develops specific programmes, some of which have adapted for use by other ESEROs. An example is a primary school course entirely based on space topics, which has been translated into English and disseminated through the network of ESEROs in Europe. In Portugal about 800 primary teachers have taken the course thanks to the collaboration of the Network of Ciência Viva Centres. "Space goes to School", a series of talks by space sector specialists in basic and secondary schools reaching about 8000 students every year, has now been recommended by ESA to the ESEROs of the other Member States. Other specific initiatives are an annual conference for teachers; a lunar camp for students (12-15 years); and Earth Observation workshops for teachers including hands-on activities.

Portugal Space is part of the Steering Committee of ESERO Portugal, supporting and participating in the main activities. A close collaboration with Portugal Space enables Ciência Viva to engage society with space sciences and the space sector, promoting space literacy and highlighting the importance of space applications for everyday life.

Telemetry data collection - CanSat 2018, Santa Maria, Azores | © Pepe Brix

CANSAT

ESERO Portugal also promotes and organizes competitions designed by ESA Education, the most popular of which in schools is CanSat Portugal. In this competition, secondary and professional school students are challenged to build a microsatellite mounted in a soda can. This gives students the opportunity to experience all phases of a small-scale space mission, from designing the basic systems of a satellite, to building the recovery parachute and the ground station. All teams perform a common mission, and design a scientific experiment, in which their creativity and scientific knowledge is put to trial. CanSats are then launched with a small rocket, an airplane, drone or balloon. The team with best results represents Portugal at the ESA International competition. Thanks to their participation in CanSat, several students were given university scholarships or were invited for internships in companies and research centres related to space. Between 2014 and 2021, 8 annual editions of CanSat Portugal have been held, involving 139 teachers and 770 students, one third of them girls. Two Portuguese teams have so far won the international competition.

Space Challenges and Student Competitions

EUROPEAN ROCKETRY CHALLENGE

Since 2020 that the Portuguese Space Agency promotes the European Rocketry Competition - EuRoC. This is an initiative aimed at university students from all over Europe and a flagship program of the Portuguese Space Agency, under the Portugal Space 2030 Strategy, which refers to the training and education of young people as key to the sustainable development of the sector. Within the scope of this competition, and during one week, undergraduate or masters students from very diverse areas launch solid, liquid or hybrid propulsion rockets, aiming to reach altitudes of 3,000 and 9,000 metres.

By promoting EuRoC, the Agency intends to stimulate the younger generations to study science, technology, engineering and mathematics (STEM) and to motivate them to consider a career not only in space, but any career related to science and technology. The interdisciplinary nature of the teams is also considered, which results from a quasi-professional approach and makes it obvious that the design, production and launch of a rocket is not only done by students in science and engineering, but is rather the result of the multidisciplinarity of the team.

One of the goals is to develop these skills in Portuguese universities, whichisalreadystartingtoshowsome results. In 2020, two Portuguese universities made demonstrations of their ongoing projects and in 2021 one of them competed in EuRoC and successfully launched its rocket.

In future editions of the competition, we intend to continue raising awareness, not only among universities, research centres, companies, but also parents and teachers who in the future may motivate younger children, as well as the general public, in an attempt to bring them closer to Space, normalising the subject and overcoming the idea that this sector is distant to them.

In the first year of the competition, and in the middle of the pandemic crisis, EuRoC 2020 hosted six teams from five European countries. In 2021, EuRoC had 19 teams from 12 European countries, in a total of around 400 students. The competition takes place in two locations: the aerodrome of Ponte de Sor, municipality with the biggest national aerospace cluster, and in the military field of Santa Margarida (Mecanized Brigade), with the support of the Portuguese Army.

EuRoC 2021: 19 teams from 13 countries joined in Santa Margarida Militar Camp to launch their rockets.

AI MOONSHOT CHALLENGE

Earth Observation programs worldwide are generating massive amounts of satellite data containing information essential for numerous sectors and for supporting policy decisions. Recent developments in powerful technologies such as Artificial Intelligence now allow us to take more value out of this data than ever before.
The AI Moonshot Challenge is an international competition promoted by the Portuguese Space Agency - Portugal Space, in cooperation with Unbabel, the Portuguese Foundation for Science and Technology (FCT), the European Space Agency (ESA), the Portuguese National Innovation Agency (ANI) and the Web Summit, that aims to find disruptive ideas combining satellite data and Artificial Intelligence (AI) to solve global challenges.
A total prize of 500K Eur is awarded to the best innovative proposals to be implemented from Portugal or in close cooperation with Portuguese institutions, being a means to bring satellite remote sensing and AI communities together, promoting knowledge transfer and boosting the use of Space data.
The challenges are launched every other year at the Web Summit and winners announced in the following edition of the Summit. The first challenge, announced in 2019, targeted the Ocean plastic pollution, and received 10 high-quality proposals from international teams, involving 13 different countries. The project SMART (diStributed AI systeM for mArine plastic debris moniToring) was announced as the first winner of the AI Moonshot Challenge in the 2020 Web Summit edition. For 2021, the Challenge is broadening the scope to include Space and Land monitoring. The teams with best innovative proposals addressing A sustainable Space for a sustainable Earth using AI and Space data will be announced winner(s) in 2022 Web Summit edition.
have been held, involving 139 teachers and 770 students, one third of them girls. Two Portuguese teams have so far won the international competition.

Hispasat-36W-1 communications satellite © ESA

SPACE ENTREPRENEURSHIP

ESA BIC Portugal

esa business incubation centre Portugal

Space entrepreneurship is a fundamental element in the National Space Strategy to develop a robust and innovative Portuguese space ecosystem. To this end, Portugal promoted the creation of an ESA Business Incubation Centre (ESA BIC) in 2014, which has been managed since then by Instituto Pedro Nunes in Coimbra and supported by ANACOM, and the Portuguese Space Agency. During the period 2014-2019, ESA BIC incubated 30 start-ups in three different Centres in Coimbra, Porto and Cascais. These companies currently employ over 100 skilled professionals, have a turnover of over 4M€ and provide innovative space-based solutions for many sectors such as agriculture, infrastructure, smart cities, health or mobility, amongst others.

In 2020 Portugal decided to boost space entrepreneurship in the country, further increasing the maximum number of start-ups to be supported every year to 12 and expanding the network of incubation centres to all regions of the country with a total of 15 Incubation Centres that host companies. As a result, more than 15 new start-ups related both to downstream and to upstream have also joined ESA BIC. They are benefiting from the coaching, networking funding and expertise that the programme offers.

Image: xxx

UA INCUBATOR, AVEIRO

PCI - Creative Science Park - Aveiro Region
Via do Conhecimento, Edifício Central,
3830-352 Aveiro
Phone +351 234 243 750
E-mail: uaincubator@pci.pt

STARTUP BRAGA, BRAGA
Edifício GNRATION,
Praça Conde Agrolongo, nº123
4700-312 Braga
Phone: +351 253 142 200
E-mail: info@startupbraga.com

INSTITUTO PEDRO NUNES, COIMBRA
Rua Pedro Nunes,
3030-199 Coimbra
Phone: +351 239 700 900
e-mail: info@ipn.pt

UBIMEDICAL, COVILHÃ
Estrada Municipal 506,
6200-284 Covilhã
Phone: +351 275 241 270
e-mail: ubimedical@ubi.pt

PARKURBIS, COVILHÃ
Parque de Ciência e Tecnologia Da Covilhã
6200-865 Tortozendo
Phone: +351 275 957 000
e-mail: info@parkurbis.pt

PACT, ÉVORA
Herdade da Barba Rala, Rua Luís Adelino
Fonseca, Lote 1A
7005-345 Évora
phone: +351 924 396 890
E-mail: geral@pact.pt

UALG TECH START, FARO
Universidade do Algarve,
Campus de Gambelas, Pavilhão B1
8005-139 Faro
Phone: +351 289 800 097
e-mail: cria@ualg.pt

STARTUP MADEIRA, FUNCHAL
Campus da Penteada
9020-105, Funchal
Phone: +351 291 723 000
E-mail: info@startupmadeira.pt

TERINOV, ILHA TERCEIRA (AZORES)
Parque de Ciência e
Tecnologia da Ilha Terceira
9700-702, Terra Chã
phone: +351 295 249 400
e-mail: geral@terinovazores.pt

STARTUP LISBOA, LISBON
Rua da Prata, 80
1100-420, Lisboa
E-mail: geral@startuplisboa.com

UPTEC & CEIIA, PORTO

CEIIA:
Av. D. Afonso Henriques, 1825
4450-017 Matosinhos
Phone: +351 220 164 800
E-mail: ceiia@ceiia.com

UPTEC:
Rua Alfredo Allen, 455/461
4200-135 Porto
Phone: +351 220 301 500
E-mail: geral@uptec.up.pt

INCUBA+, SANTA MARIA (AZORES)
Rua de Ponta Delgada –
Aeroporto de Santa Maria,
Vila do Porto
9580-434, Vila do Porto
Phone: +351 296 248 710
E-mail: incubamais@ilhasdevalor.pt

SANJOTEC, SÃO JOÃO DA MADEIRA
Rua de Fundões, 151
3700-121, São João da Madeira
Phone: +351 256 011 900
E-mail: geeral@sanjotec.com

NONAGON, SÃO MIGUEL
Rua da Tecnologia K - Epsilon, 2
9560-421 Rosário, Lagoa
Phone: +351 296 249 400
E-mail: geral@nonagon.pt

Image: ESA BIC Portugal - Incubation Centres Network

Copernicus and Galileo Masters

Copernicus and Galileo are the two space flagship programmes of the European Union upon which many innovative solutions are developed to benefit other sectors of our society. At a European level, the Copernicus and Galileo Masters competitions are the global competitions that award, since 2011 and 2004 respectively, the most innovative solutions that utilize these EU space assets. These competitions are an excellent opportunity for SMEs and start-ups to mature and showcase their ideas. Every year, the competitions gather both the most renowned European space-related institutions, who sponsor specific challenges and many regions across Europe, supporting specific regional prizes.

In Portugal, during the last years, different companies participated in the competitions. Tree of them (Spacelayer Technologies, CybELE and THEIA) have won various prizes of Copernicus Masters since 2017. In 2021, Portugal Space decided to go one step further and sponsored the Portugal Space Atlantic Challenge, the Regional Copernicus Prize Azores and Regional Galileo Prize Portugal to encourage entrepreneurship in Europe and Portugal in line with the strategic goals of the Portuguese Space strategy. These Portuguese prizes, co-funded by the European Union, were organized by the Portuguese Space Agency and counted with the support from other Portuguese partners such as the AIR Centre, Instituto Pedro Nunes, NOVA SBE, ANACOM, ARDITI and the University of Azores

Space for Business Program

To meet the growing demand for business education in this field, three renowned European business schools, University of St Gallen (HSG) from Switzerland, Nova School of Business and Economics (Nova SBE) from Portugal, and Rotterdam School of Management, Erasmus University (RSM) from the Netherlands, have joined forces to launch the first European executive space business program in collaboration with ESA, the European Space Agency. The program is targeted at space and non-space professionals and entrepreneurs who want to increase their management know-how and skills, who want to understand how the space sector offers new business opportunities and creates new business models, and who want to kickstart their career in the space sector.

CASSINI

CASSINI is the European Commission's new initiative to support innovative entrepreneurs, start-ups and SMEs in the space industry, including New Space, during 2021-2027.
The initiative is open to all areas of the EU Space Programme, and covers both upstream (e.g. nanosats, launchers, etc.) and downstream (i.e. products/ services enabled by space data) and intends to:
Expand the number of start-ups in the EU building business based on innovative EU space technologies; Increase their chances to success; Accelerate and secure their growth & scale up.
CASSINI includes, as centrepiece, a €1 billion EU seed and growth fund, as well as hackathons and mentoring, prizes, a business accelerator, partnering, matchmaking and in-orbit demonstration being structured around 6 main areas:

PROMOTION
Hackatons & Mentoring

INNOVATION COMPETITIONS
PRIZES

BUSINESS GROWTH
Business Accelerator

INVESTIMENT
Seed and Growth Funding Facility (InvestEU)

MATCHMAKING
Matchmaking with Investors and Industrial partners

IOD/ IOV
In-Orbit Demonstration & Validation

Higher Education Institutions – Engineering Degrees

Due to the infrastructure and services, it provides, space holds undeniable value in society. In order to guarantee the space sector's maintenance and sustainable growth, working towards its full potential, training of the future workforce is arguably one of the most important goals.

In Portuguese higher education institutions, space is already embedded in different degrees, where mentioning engineering is unavoidable: space can be the solution or the subject of the technological needs and challenges addressed in many of these degrees.

From the use of satellite imagery to analyze topographic characteristics to the importance of developing space-based secure communications and cyber-resilient infrastructures, space requires and enables a wide range of subjects to be developed to and from it, creating a cycle that feeds into itself.

Space has also been gaining traction within the Portuguese higher education, and one of the reflections of this growth is that Aerospace Engineering degrees are being created in different universities in the country.

The following list of higher education institutions offers a wide range of engineering degrees that through various subjects contribute to the space sector, either by taking advantage or adding to what it has to offer.

Instituto Universitário Militar *www.ium.pt*

- Academia da Força Aérea *www.academiafa.edu.pt*
- Academia Militar *www.academiamilitar.pt*
- Escola Naval *www.escolanaval.pt*

Instituto Politécnico da Guarda *www.ipg.pt*

- Escola Superior de Tecnologia e Gestão *www.estg.ipg.pt*

Instituto Politécnico de Beja *www.ipbeja.pt*

- Escola Superior Agrária *www.ipbeja.pt UnidadesOrganicas/ESA/*
- Escola Superior de Tecnologia e de Gestão *www.ipbeja.pt UnidadesOrganicas/ESTIG/*

Instituto Politécnico de Bragança *http://portal3.ipb.pt*

- Escola Superior Agrária de Bragança *http://esa.ipb.pt*
- Escola Superior de Tecnologia e de Gestão de Bragança *https://estig.ipb.pt*

Instituto Politécnico de Castelo Branco *www.ipcb.pt*

- Escola Superior Agrária de Castelo Branco *www.ipcb.pt/esacb/escola-superior-agraria*
- Escola Superior de Tecnologia de Castelo Branco *www.ipcb.pt/estcb/escola-superior-de-tecnologia*

Instituto Politécnico de Coimbra *www.ipc.pt*

- Escola Superior Agrária de Coimbra *http://portal.esac.pt*
- Escola Superior de Tecnologia e Gestão de Oliveira do Hospital *www.estgoh.ipc.pt*
- Instituto Superior de Engenharia de Coimbra *www.isec.pt*

Instituto Politécnico de Leiria *www.ipleiria.pt*

- Escola Superior de Tecnologia e Gestão *www.ipleiria.pt/estg*

Instituto Politécnico de Lisboa *www.ipl.pt*

- Instituto Superior de Engenharia de Lisboa *www.isel.pt*

Instituto Politécnico de Portalegre *www.ipportalegre.pt*

- Escola Superior de Tecnologia e Gestão *www.estgp.pt*

Instituto Politécnico de Santarém *www.ipsantarem.pt*

- Escola Superior Agrária de Santarém *https://siesa.ipsantarem.pt*

Instituto Politécnico de Setúbal *www.ips.pt*

- Escola Superior de Tecnologia de Setúbal *www.estsetubal.ips.pt*
- Escola Superior de T ecnologia do Barreiro *www.estbarreiro.ips.pt*

Instituto Politécnico de Tomar *www.ipt.pt*

- Escola Superior de Tecnologia de Abrantes
- Escola Superior de Tecnologia de Tomar

Instituto Politécnico de Viana do Castelo *www.ipvc.pt*

- Escola Superior Agrária *www.ipvc.pt/esa*
- Escola Superior de Tecnologia e Gestão *www.ipvc.pt/estg*

Instituto Politécnico de Viseu *www.ipv.pt*

- Escola Superior Agrária de Viseu *www.esav.ipv.pt*
- Escola Superior de Tecnologia e Gestão de Lamego *www1.estgl.ipv.pt*
- Escola Superior de Tecnologia e Gestão de Viseu *www.estgv.ipv.pt*

Instituto Politécnico do Cávado e do Ave *https://ipca.pt*

- Escola Superior de Tecnologia https://est.ipca.pt

Instituto Politécnico do Porto *www.ipp.pt*

- Escola Superior de Tecnologia e Gestão *www.estg.ipp.pt*
- Instituto Superior de Engenharia do Porto *www.isep.ipp.pt*

ISCTE - Instituto Universitário de Lisboa *www.iscte-iul.pt*

Universidade Aberta *www.uab.pt*

Universidade da Beira Interior *www.ubi.pt*

Universidade da Madeira *www.uma.pt*

- Faculdade de Ciências Exatas e da Engenharia *www.cee.uma.pt*

Universidade de Aveiro *www.ua.pt*

Universidade de Coimbra www.uc.pt

- Faculdade de Ciências e Tecnologia *www.uc.pt/fctuc*

Universidade de Évora *www.uevora.pt*

- Escola de Ciências e Tecnologia *www.ect.uevora.pt*

Universidade de Lisboa *www.ulisboa.pt*

- Faculdade de Ciências *https://ciencias.ulisboa.pt*
- Instituto Superior de Agronomia *https://www.isa.ulisboa.pt*
- Instituto Superior Técnico *https://tecnico.ulisboa.pt*
- Instituto Superior Técnico (TagusPark) *https://tecnico.ulisboa.pt*

Universidade de Trás-os-Montes e Alto Douro *www.utad.pt*

- Escola de Ciências Agrárias e Veterinárias *www.utad.pt/ecav*
- Escola de Ciências da Vida e do Ambiente *www.utad.pt/ecva*
- Escola de Ciências e Tecnologia *www.utad.pt/ect*

Universidade do Algarve *www.ualg.pt*

- Faculdade de Ciências e Tecnologia *https://fct.ualg.pt*

Universidade do Minho *www.uminho.pt*

Universidade do Porto *www.up.pt*

- Faculdade de Ciências *https://sigarra.up.pt/fcup/*
- Faculdade de Engenharia *https://sigarra.up.pt/feup/*

Universidade dos Açores *www.uac.pt*

- Faculdade de Ciências Agrárias e do Ambiente
- Faculdade de Ciências e Tecnologia

Universidade Nova de Lisboa *www.unl.pt*

- Faculdade de Ciências e Tecnologia *www.fct.unl.pt*

Atlântica - Escola Universitária de Ciências Empresariais, Saúde, Tecnologias e Engenharia *www.uatlantica.pt*

Instituto Politécnico Jean Piaget do Sul *https://ipiaget.org*

- Escola Superior de Tecnologia e Gestão Jean Piaget *https://ipiaget.org/escola-superior-de-tecnologia-e-gestao-almada*

Instituto Superior de Tecnologias Avançadas de Lisboa *www.istec.pt*

Instituto Superior de Tecnologias Avançadas do Porto *http://istec-porto.pt*

Instituto Superior Manuel Teixeira Gomes *www.ismat.pt*

Instituto Superior Politécnico Gaya *www.ispgaya.pt*

- Escola Superior de Ciência e Tecnologia

ISEC Lisboa - Instituto Superior de Educação e Ciências *www.iseclisboa.pt*

ISLA - Instituto Politécnico de Gestão e Tecnologia *www.islagaia.pt*

- Escola Superior de Tecnologia

Universidade Autónoma de Lisboa Luís de Camões *https://autonoma.pt*

Universidade Católica Portuguesa *www.ucp.pt*

- Escola Superior de Biotecnologia *https://esb.ucp.pt*

Universidade Europeia *www.europeia.pt*

Universidade Fernando Pessoa *www.ufp.pt*

Universidade Lusíada - Lisboa *www.lis.ulusiada.pt*

Universidade Lusíada - Vila Nova de Famalicão *www.fam.ulusiada.pt*

Universidade Lusófona de Humanidades e Tecnologias *www.ulusofona.pt*

Universidade Lusófona do Porto *www.ulp.pt*

Universidade Portucalense Infante D. Henrique *www.upt.pt*

MAIN INTERNATIONAL PARTNERSHIPS

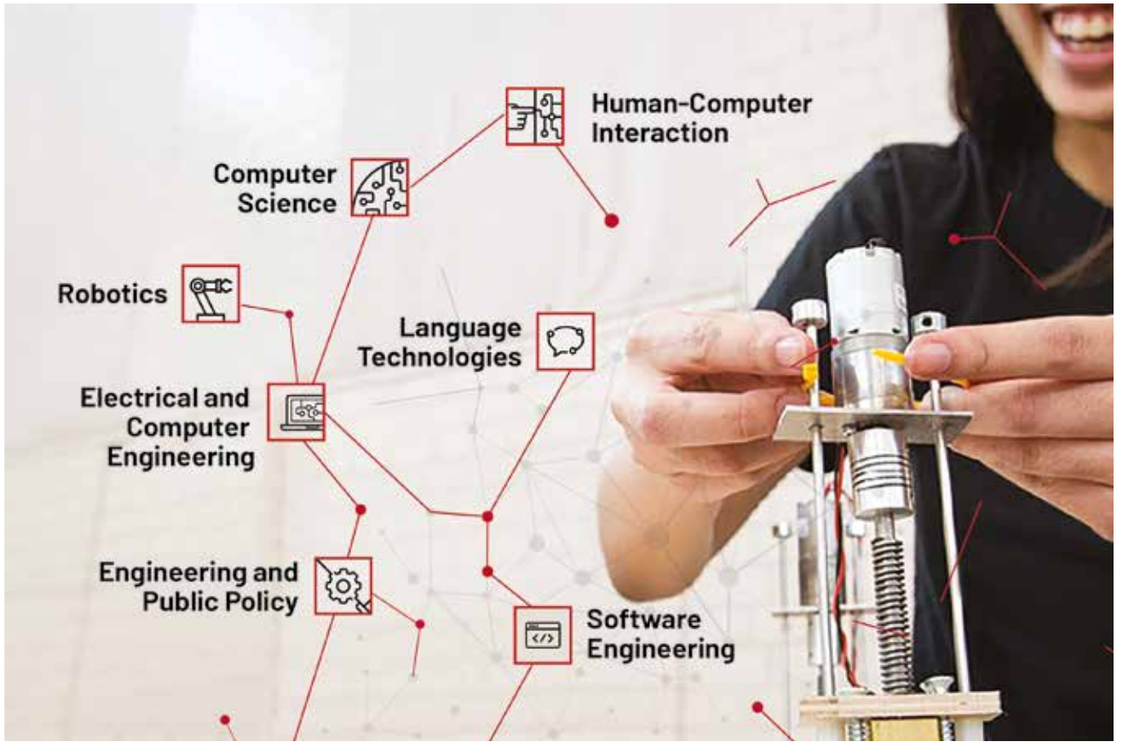
goPORTUGAL Program

Through the Portuguese Science and Technology Foundation (FCT), the country has signed a protocol for hosting Portuguese students at NASA and ESA premises to complete traineeships relevant for their training and professional experience.
Through FCT, Portugal has also established links with leading American universities, mainly through projects of cooperation with Portuguese space companies and universities. These dedicated partnerships are implemented in collaboration with relevant international actors, through the GoPORTUGALProgram – Global Science and Technology Partnership Portugal.
The GoPORTUGAL program has the goal to enable, foster and strengthen scientific collaboration among Portuguese universities and their integration into internationally acknowledged networks. It especially focuses on nurturing innovative research projects and the training of highly qualified human resources, to strengthen scientific and technological competences in Portugal.

MIT Portugal Program

The MIT Portugal Program (MPP) is an international partnership to foster collaborative research between the MIT and Portuguese universities, research institutes, laboratories and companies. MPP has a problem- solving culture which nurtures innovative ideas to tackle global challenges in strategic areas for our planet: Climate Science and Climate Change, Earth Systems: from Oceans to Near Space, Digital Transformation in Manufacturing, and Sustainable Cities, anchored to Data Science.
Since 2006, MPP has facilitated top-quality educational and research opportunities for students, researchers, faculty, and industry partners, contributing to strengthening the Portuguese academic and industrial ecosystem, and build a more sustainable environment, economy, and society.

© MIT Portugal



© CMU Portugal

CMU Portugal

The Carnegie Mellon Portugal Program (CMU Portugal) is a platform for education, research, and innovation that brings together Carnegie Mellon University and Portugal. Launched in 2006 by FCT, its mission is to place Portugal at the forefront of R&D in ICT by fostering collaborations between industry and academia, promoting cutting-edge collaborative research projects, and supporting talent through Dual Degree Ph.D. Programs. CMU Portugal is proud to count on all six Unicorn Companies with Portuguese DNA within its industrial ecosystem. With the commitment of all its partners, CMU Portugal will keep on strengthening industry-science relationships and building a community of agents of change in a data-driven economy with research for social and economic impact.

UT Austin Portugal

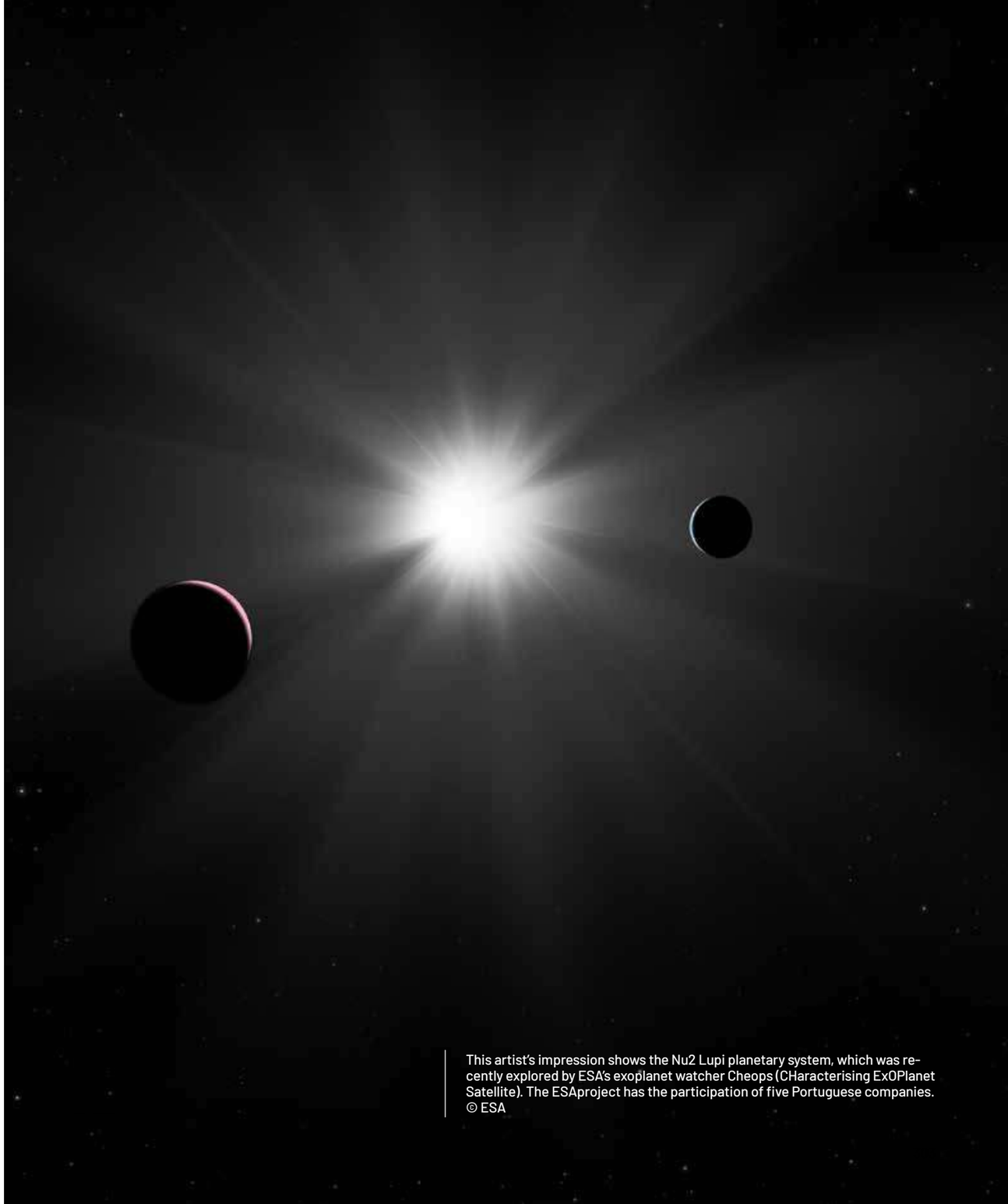
© Good Free Photos

Space-Earth Interactions is one of UT Austin Portugal's core knowledge areas.
It seeks to promote transatlantic and north-south cooperation in complex engineering systems and science towards a holistic approach to space technologies, sea, climate and clean energy. Researchers in Portugal and UT Austin have been working together to unlock the full potential of integrating space, air and sea-borne data to improve our understanding of how space, earth, and oceans interact. This way, predictive capabilities under climate change scenarios can also be significantly enhanced.
Research projects such as uPGRADE and MAGAL attest to the Program's contribution to shaping a new ecosystem of space-enabled innovation.

Fraunhofer Portugal AWAM

Fraunhofer Portugal's mission to undertake applied research of direct utility to private and public enterprises is currently materialized through its two Research Centers. The most recent one, the Fraunhofer Research Centre for Smart Agriculture and Water Management (FhP-AWAM) was created in 2019 and develops technological solutions for sectors such as agriculture, food and beverages production, (waste)water treatment, pulp and paper, (bio)energy and (bio) chemical industries, with a clear focus on customers, to provide cutting-edge solutions for a sustainable circular economy.

© Franhofer Portugal



This artist's impression shows the Nu2 Lupi planetary system, which was recently explored by ESA's exoplanet watcher Cheops (CHaracterising ExOPlanet Satellite). The ESAproject has the participation of five Portuguese companies.
© ESA

MAIN ANNUAL SPACE FAIRS, SUMMITS AND CONFERENCES

New Space Atlantic Summit

The annual Conference of the Portuguese Space Agency traditionally focused on the so-called New Space, namely on the themes of Earth Observation and downstream applications, which allow the connection of the space and non-space sectors.

The conference has been held since 2018 and builds on Space not only as fundamental to the development of new markets and economic activities (e.g. autonomous shipping, energy, satellite constellations) but also as a crucial sector for ocean science and sustainability (e.g. enabling studies on climate change, pollution monitoring, clean energy, aquaculture and the impact of fisheries on the environment). The development of new technologies to monitor and promote a clean, healthy, and economically valuable ocean must also consider the effective use of space orbits and contribute to Clean Space. Space technology is recognised in all its components, integrating Earth Observation (EO) and Navigation and Communication areas, contributing to developing innovative services and increasing competitiveness.

NEW SPACE FOR PEOPLE

2021, Coimbra

The 4th edition of the New Space Atlantic Summit was organised in the framework of the Portuguese Presidency of the Council of the European Union. Held on 8 June 2021 in Coimbra, Portugal, the event focused on **"New Space for People"**, namely on Earth Observation and downstream applications, will pay particular attention to the development of New Space, including the use of space technologies and applications in non-space sectors and public policies.

CLEAN OCEANS WITH CLEAN SPACE

2020, Online

The 3rd New Space Atlantic Summit focused on how the Atlantic region can use its space capacities to ensure **"clean Oceans with clean Space"**. Discussions focused on how people can use Space to preserve, manage, and utilise our marine resources and ecosystems, monitor safety and security, use geolocation services for transportation, and, of course, the science applications. Due to the pandemic situation, the 3rd New Space Atlantic Summit was an online event.

NEW SPACE ATLANTIC SUMMIT

2019, SANTA MARIA, AZORES

Promoted by the newly created Portuguese Space Agency - Portugal Space, the 2019 *New Space Atlantic Summit* was held in Santa Maria Island, in the Azores, on June 21-22. The event addressed the evolution of the remit of Space and the role of Space Agencies from pure agencies to partners, facilitators, mediators, brokers and enablers, and the take-up of new opportunities for Space and other sectors.

NEW SPACE ATLANTIC SUMMIT

2018, Lisbon

The first edition of the New Space Atlantic Summit was held on 28 and 29 May 2018, aiming to promote the Portuguese space strategy - Portugal Space 2030 - and its associated initiatives, with emphasis on international cooperation and the mobilisation of important actors for the activities emerging in the area of Space in Portugal. It was organised by the Science and Technology Foundation, with the support of the Space Frontier Foundation and Ciência Viva Agency.

Space in the Annual National Science Summits

The Encontro Ciência, organised by the Fundação para a Ciência e a Tecnologia (FCT) with the support of the Ciência Viva, is an annual event that brings together researchers from all areas of knowledge for a moment of reflection and open discussion on the challenges of the national and international scientific agendas. Political decision-makers and the business sector also attend it. Since its first editions, the programme has included discussion panels dedicated to the topic of Space.

It has featured talks by national and foreign researchers in astronomy and astrophysics, among others, and speeches on the importance of investment in the Space sector and its return for the Portuguese economy. The 2018 edition saw the announcement of the creation of the Portuguese Space Agency and hosted a session on the "50 years of the first moon landing".

© DR

Web Summit

Web Summit, Europe's largest technology conference, and has been held annually in Portugal since 2017. The following year, the organisation and the Portuguese Government announced a 10-year partnership to establish the conference in Lisbon until 2028. The technology summit revolves around internet technology, and its' attendees go from world-known companies to small technology startups. In the span of four days, Web Summit brings together more than 40.000 people and companies from all around the world.
Although technology-related themes are the main attraction in Web Summit, the event is also a place where subjects like marketing, media, society, environment, commerce, lifestyle or business development are discussed.
Ricardo Conde, the president of the Portuguese Space Agency, was one of the more than 700 speakers of the 2021 edition of the Web Summit. In the **"Looking up, looking down: Building space sector capacity in Portugal"** sector, Ricardo Conde talked about the past, present and future of the spatial sector in the country, focusing on the stimulus that the Portuguese Space Agency has given to the sector since its establishment in 2019. The president of the Portuguese Space Agency focused on the relationship between the spatial industry and academia — which has been developing more and more since the agency's foundation — and in the continuous efforts that the sector has been done to guarantee a sustainable future through the most innovative tools and technologies.

AI Moonshot Challenge, the first worldwide competition to combine AI and emerging space technologies to fight maritime pollution, was announced in the 2019 edition of the Web Summit. Since then, the event has been the competition stage: The winners of the first edition were presented during the 2020 event, and in 2021 a new challenge was launched there.

Mike Massimino, Astronaut, on Startup University Stage during the opening day of Web Summit 2017 at Altice Arena in Lisbon © David Fitzgerald

© DR

Portugal Air Summit

Portugal Air Summit is the most prominent summit in the Iberian Peninsula about the aeronautics, defence and space sectors. Held in Ponte de Sor since its' first edition, which took place in 2017, the event invites de most relevant entities and personalities in the industry, services and infrastructure. In addition to conferences, the event also has a exhibitors' area and many activities, such as airshows, concerts and drone races. For the aeronautics sector, it is the place to be for networking opportunities.

Another event has taken place in Ponte de Sor simultaneously since 2020: the European Rocketry Challenge (EuRoC), which brings together thousands of European university students. The competition's primary goal is to stimulate engineering students to design, build and launch their rockets and encourage young people to study science, technology, engineering, and math (STEM). EuRoC is promoted by the Portuguese Space Agency – Portugal Space.

AED Days

AED Days Portugal is a non-profit private organisation created in 2016. It is the Portuguese cluster for the aeronautics, Space and defence (ASD) industries. More than 90 entities established in Portugal are already involved in the cluster, bringing together the main stakeholders of these three sectors.
The Cluster organises the AED Days, which offers attendees a unique opportunity to meet the national ecosystem and leading international players of the mentioned industries. In the event, the participants reunite to debate the current and future challenges of the ASD sectors in Portugal and the rest of the world and to seek business and partnership opportunities. In 2021, the 8th edition of this event had a record-breaking number of participants (more than 800) and enterprises (more than 370, from 30 different countries).

© AED

Air Centre Networking Fridays

In times of social distancing due to the covid-19 pandemic, Air Centre Networking Fridays brought people together to discuss various themes. Every Friday, attendees from governments, academia, organizations, companies, entrepreneurship and civil society from more than 100 countries all over the world gathered to talk about a wide range of topics in each session — including bioeconomy, coastal observation, marine biodiversity and, of course, the relation between the Earth, Space and sustainability.

VdA Workshops

VdA has been involved in various workshops regarding the Space sector, such as: International Workshop for the 10th Anniversary of the SES Chair of National Space Legislation (2021); Concurrent Engineering Summer School, Valispace e Spaceway (2021); Advanced LL.M. on Air and Space Law, panela on Space law and policy (2021) and European and Commercial Perspectives of Space (2020) Law Leiden University; New Hot Spot for Space conference – Portugal, Access Space Alliance (2020); Space Law Conference, United Nations Office for Outer Space Affairs (UNOOSA), 2020; International Space University Executive Course, panels on Space Law and Intellectual Property, Lisbon (2020); Space Studies Program, International Space University, Strasbourg (2019) and Granada (2021); Space Law course, University of Lisbon Law School (2019); Outer Space for Development, Policy, Business and Regulatory Summit, European Centre for Space Law (ECSL).
VdA is a member of the International Astronautical Federation (IAF) and the International Institute of Space Law (IISL).

SPACE AND THE ARTS

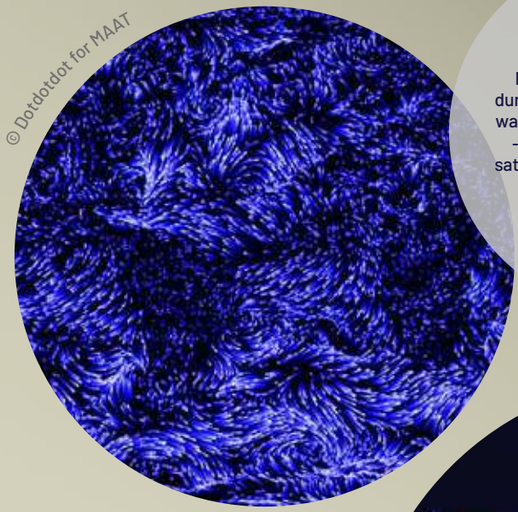
EARTH BITS – SENSING THE PLANET

DOTDOTDOT STUDIO

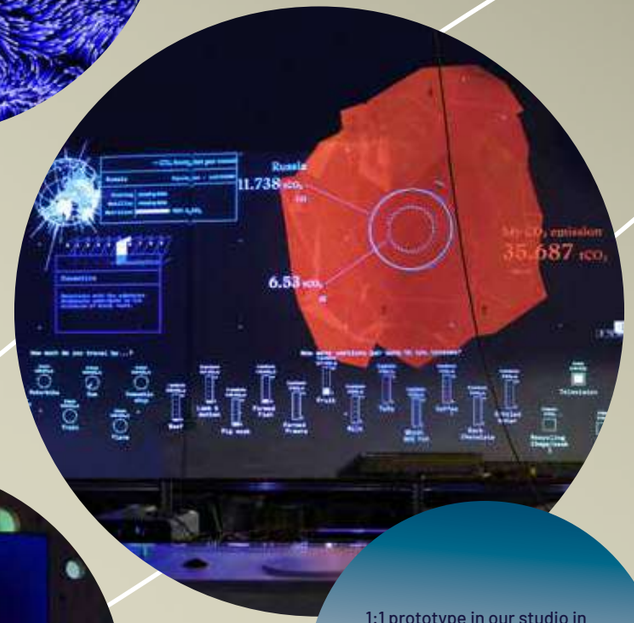
Earth Bits – Sensing the Planet,
a data-driven installation developed by Dotdotdot studio, brought to MAAT a new perspective on humankind's carbon footprint in 2021. Being a two-year project, its second phase will be launched in March 2022 with updated content.

Using data from the ESA Copernicus program of sentinels, the installation provided, through video, an explanation of the correlation between rising anthropogenic GHG emissions and the increasing occurrence of environmental events like wildfire, droughts.

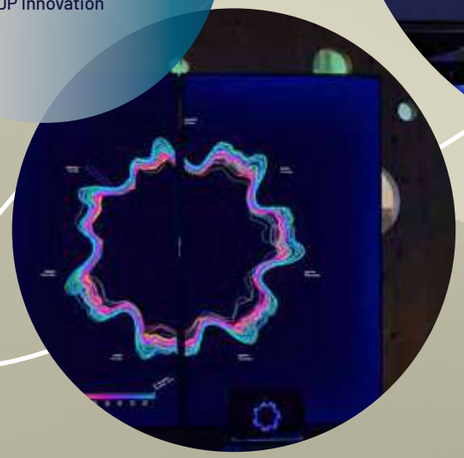
Earth Bits – Sensing the Planet was developed with the scientific support of the Portuguese Space Agency – Portugal Space, the European Space Agency, the International Energy Agency and EDP (Energias de Portugal).



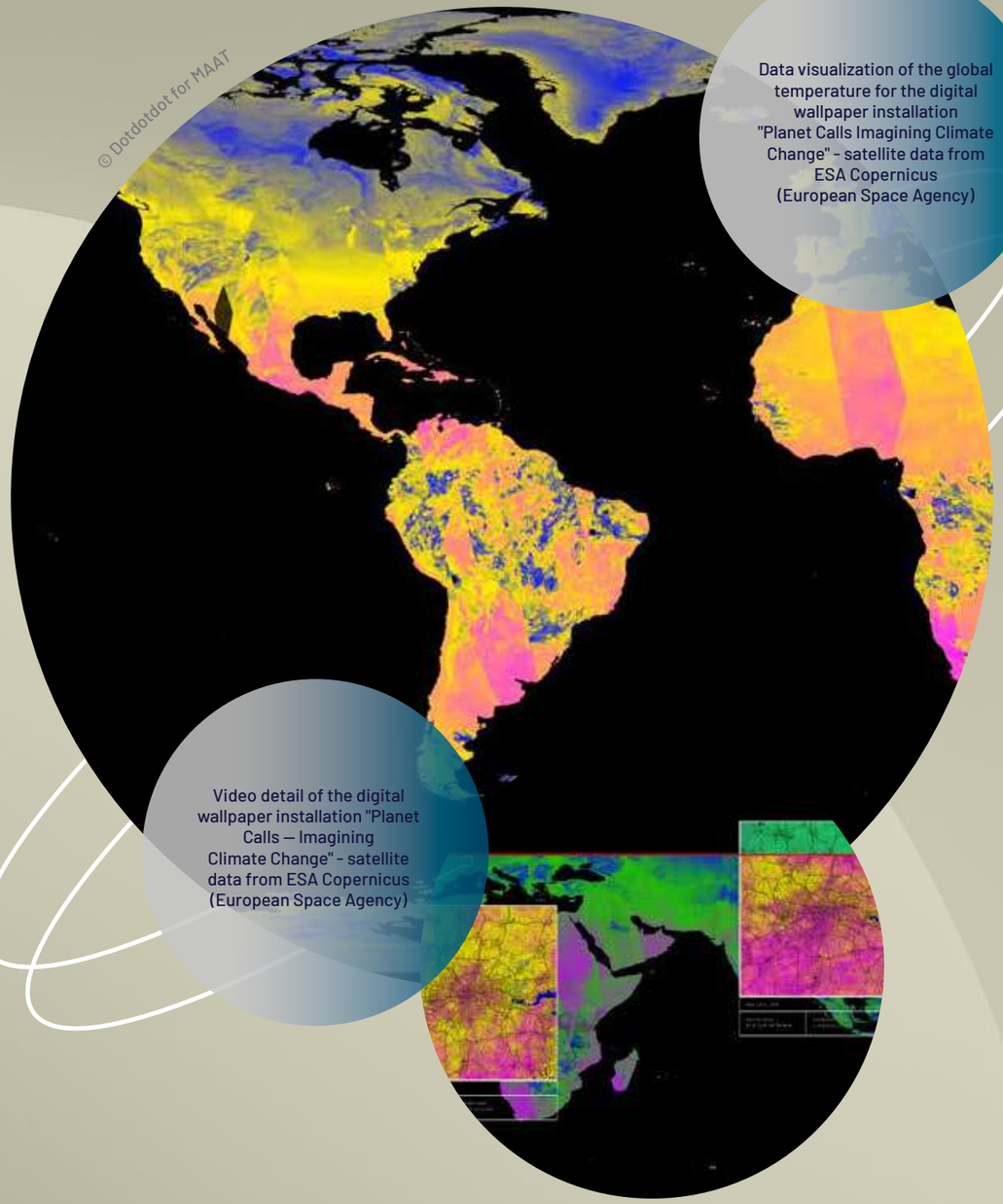
Data visualization of the wind during summer 2020 for the digital wallpaper installation "Planet Calls — Imagining Climate Change" - satellite data from ESA Copernicus (European Space Agency)



Detail of the data visualisation for "Power Rings" — video compiled with data from the Portugal electricity consumption (2019—2020) in collaboration with EDP Innovation

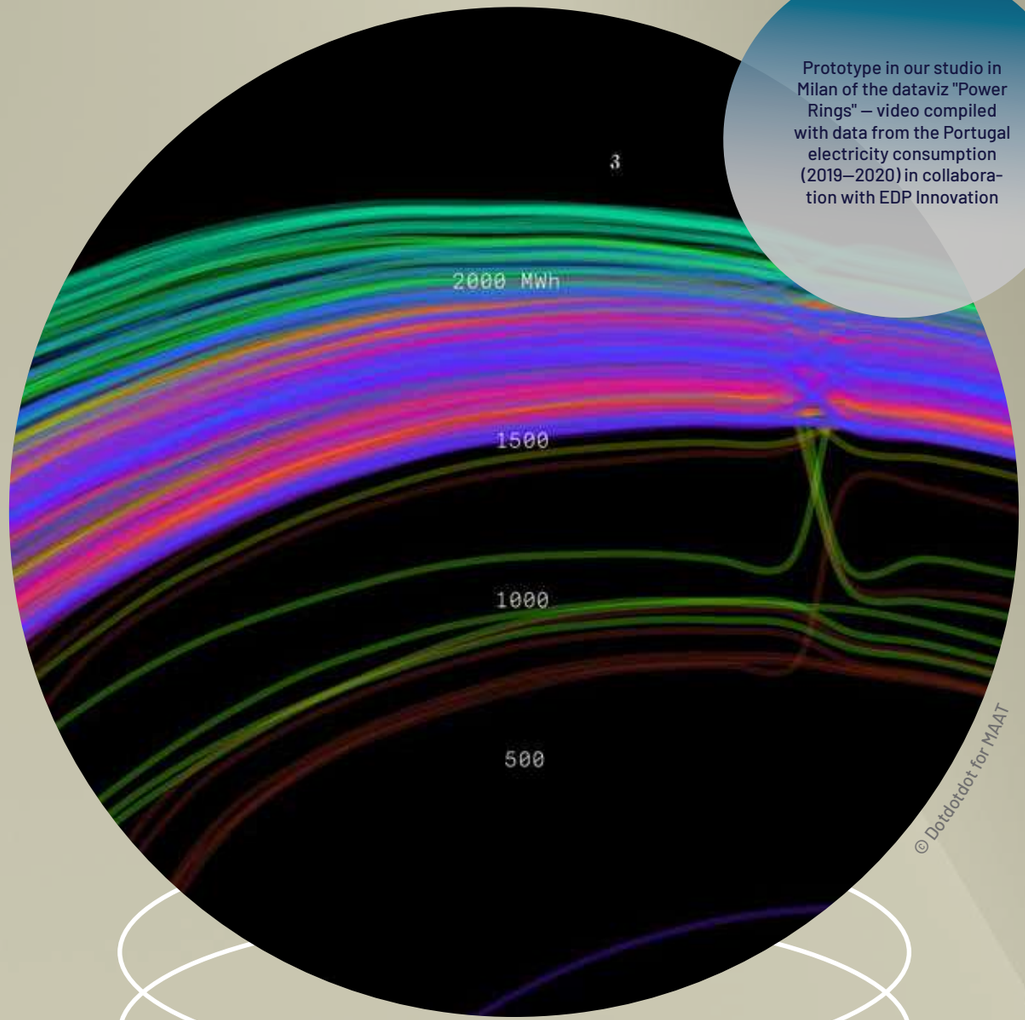


1:1 prototype in our studio in Milan of the interactive console "The C02 Mixer" - in collaboration with EDP Innovation - data from EDP Sustainability, IEA (International Energy Agency), and FAO



Data visualization of the global temperature for the digital wallpaper installation "Planet Calls Imagining Climate Change" - satellite data from ESA Copernicus (European Space Agency)

Video detail of the digital wallpaper installation "Planet Calls — Imagining Climate Change" - satellite data from ESA Copernicus (European Space Agency)



Prototype in our studio in Milan of the dataviz "Power Rings" — video compiled with data from the Portugal electricity consumption (2019—2020) in collaboration with EDP Innovation

CINDERELLA CYBORG

JÚLIO RESENDE

In the 2018 album *Cinderella Cyborg*, Julio Resende explored the human/machine duality, reflecting on that dynamic through his piano. Electronic sounds were also present in the album, reflecting his will to explore another duality — this time between acoustic and electronic music. In the album, he issues a challenge to humanity with

Let's Go to the Moon Again,

a song where Neil Armstrong's description of the moon is slowly unrolled as the piano leads us towards levitation, in a unique sonic experience with imaginary doses of microgravity.
As a reminder of what can be achieved when humankind uses machines to attain progress, the music video for this track was launched on the 50th birthday of the first lunar landing.

©Júlio Resende

PORTUGAL SPACE GOVERNANCE

PORTUGAL SPACE GOVERNANCE

The primary decision-making, executive and managerial bodies at the Portuguese Space Agency - Portugal Space are the General Assembly, the Board of directors and the Financial Committee.

The members of the General Assembly are the Foundation for Science and Technology (FCT), the National Innovation Agency (ANI), the Ministry of Defence and the Regional Government of the Azores.

The Portugal Space Board of Directors has five elements, elected for five-year terms (2021-2026): two executives (President and one Director) and three non-executives (Vice-president and two Directors).

The Financial Committee (without executive functions) has three elements, one of which must be a statutory auditor. The General Assembly designates Financial Committee's members, who cannot hold any administration or day-to-day management functions at Portugal Space.

PRESIDENCY

RICARDO CONDE, PRESIDENT

Ricardo Conde, 55 years old, is the father of two beautiful girls. He has a degree in Electrical and Computer Engineering from IST – Technical University of Lisbon and a postgraduate degree in Space Technologies. He began his professional career in 1991, having been linked to the Aeronautics and Space sector since 1993 with the participation in several National and International programs, particularly in Space and Ground segments. In 2019, Ricardo joined the Portuguese Space Agency, Portugal Space as a member of the board. About one year later, Ricardo Conde was appointed President of the Portuguese Space Agency.

EDUARDO FERREIRA, VICE-PRESIDENT

Eduardo Ferreira is an engineer who graduated from Instituto Superior Técnico and works at NAV, the Portuguese Air Navigation Service Provider, in the role of Air Traffic Safety Electronics Personnel supporting ATM systems. Eduardo's passion for education, associated with his technical and aerospace background, drive his contributions to the promotion of STEM for young students. He has cooperated with the educational system on several projects, and has also been part of the jury of CANSAT and EuRoC. He is involved with Ciência Viva and Esero in the *Space Teacher* conferences.

THE TEAM

HUGO ANDRÉ COSTA, MEMBER OF THE BOARD

Hugo André Costa, born and raised in the north of Portugal, has a background in physics by the Minho University. His love for space took him to Strasbourg to study a Master in Space Studies at the International Space University and later an MBA at the Frankfurt School of Finance and Management. He worked at the FCT Space Office as the Portuguese representative at ESA, in the space industry both in Space and Ground Segment in Spain and Germany. Before accepting this new challenge, he worked at EUMETSAT in the Copernicus Programme Office. Now, he serves on the Executive Board of the Portuguese Space Agency. Now, back in Portugal, he hopes to surf more often and, when possible, to participate in sprint triathlons.

CARLA SANTOS, NON-EXECUTIVE BOARD MEMBER

Carla Santos has a degree and a Master's in International Relations, with several specialisations in science and technology management. Her professional career, always linked to Science is divided between Lisbon and the permanent representation of Portugal to the European Union in Brussels. For years he has been following the development of Space in Europe and Portugal in particular. She is proud to have been closely involved in creating the Portuguese Space Agency and the emblematic projects it carries out and to have chaired the Council's preparatory group in the area of Space during the Portuguese Presidency of the Council of the EU. Carla enjoys being in nature and practices yoga and meditation.

LUÍS CASTRO HENRIQUES, NON-EXECUTIVE BOARD MEMBER

Throughout his academic and professional life, Luís lived in several cities — both in Europe and in Asia. However, it is in Portugal that he has his roots. He is an Economist, with a Masters in Economics from Cambridge University, an MBA from INSEAD and a Degree in Economics from the Catholic University of Portugal.
Luís is currently the Chairman of the Board of Directors of AICEP (Agency for Investment and Foreign Trade), having also worked for the EDP Group and McKinsey & Company. He was also Deputy of the Minister of Economic Activities and Labor of the XVI Constitutional Government and of the Secretary of State for Housing of the XV Constitutional Government of Portugal.

ÁLVARO LOPES, EDUCATION

Born in Portimão and raised in Almada, Álvaro Lopes was always fascinated by technology, dedicating most of his free time to learning and developing small electromechanical projects. Such passion led him to study Mechanical Engineering and Programming. Since young, he had the chance to learn metalomechanical arts with his master and grandfather, whom he still makes projects with till today, and while he waited for an opportunity, he worked in a mechanical workshop. Outside the city, his habitat is at the cliffs and scarps where he rock-climbs regularly, always searching for new challenges to reach higher places.

ANA SOUSA, EXECUTIVE ASSISTANT

With a degree in Sociology and a major in Human Resources, Ana always liked to deal with people and ended up working for 14 years in the watch market sector as a commercial assistant, offering specialized service and a high degree of commitment to her clients.
When joining Portugal Space, Time and Space took on a new meaning. The integration in the team and its mission, made her look at the sky in a different way and the impossible became a world of infinite possibilities.

ANTÓNIO SOUSA FRANCO, DUAL USE TECHNOLOGIES OFFICER

António has a degree in Military Sciences and pursued his career path in the Defence area. Fifteen years ago, he took up the Cartography and Geographic Information Systems fields, ending up with a degree and a master's in Geographic Engineering from the University of Sciences of the University of Lisbon.
A specialist in the acquisition of data by Photogrammetric processes and Remote Sensing, he has, alongside his military career, numerous responsibilities and research projects in this technical field. One of his main interests is image analysis, having taken and coordinated various formations, which made him promptly accept the challenge of working in the space sector.

CAROLINA RÊGO COSTA, LEGAL OFFICER

Carolina was born in São Miguel, Azores. Married and with three children, she graduated in the Law Faculty of the University of Lisbon and began her career as a public law lawyer in PLMJ – Sociedade de Advogados. For the last 15 years, she has been engaged in the field of Science, Technology & Higher Education as part of the cabinets of several Ministers and Secretary of State, both as legal adviser and as head of the cabinet. As a civil servant at Fundação para a Ciência e Tecnologia, Carolina was the legal adviser of the Board. She was Portugal's representative at the INL Council and is a member of the AD AIR CENTRE Board. She recalls having had hobbies at some point in life.

CAROLINA SÁ, EARTH OBSERVATION OFFICER

Carolina is the project officer of the agency for Earth Observation. She comes from the Marine Sciences world and was led into the satellite remote sensing sphere by her will to study microscopic aquatic plants (i.e. phytoplankton) from a different perspective – from Space!
She specialized in Ocean Colour remote sensing and worked as a researcher for more than 10 years, focusing on satellite data validation activities and applications to promote and support the Blue economy. Her aim now is to bridge the gap between Earth Observation research and applications, science and industry, technology and society. She hates to talk about herself in the third person, but loves a good trekking!

CLAUDIO MELO, SCIENCE OFFICER

Claudio Melo is an astronomer born in the beautiful coastal city of Natal (Brazil) holding a PhD in Astrophysics from the University of Geneva, Switzerland.
The astonishing beauty of the night sky and his drive to explore the Universe took him to Atacama Desert in Chile where he became a science fellow at the European Southern Observatory (ESO) in 2002, becoming a staff astronomer in 2006. For almost 20 years, Claudio contributed to ESO in many different roles from observatory operations, science management, and more recently in science policy and diplomacy. Claudio's research interests focus on exoplanets and young stars. Inspired by the Portuguese ambitions of making space part of the country's life,

FERNANDO PEREIRA, DUAL USE TECHNOLOGIES OFFICER

In the sea that is the life of Fernando Pereira, there was a wave that opened the door to space. Until then, and for several years, he was head of service in multiple ships of the Portuguese Navy. He also commanded the NRP Rio Minho in familiar waters, close to Vila Praia de Âncora, from where he is from.
Before arriving at the Portuguese Space Agency, Portugal Space, he held several senior positions, which improved his human relations skills. Now, he embarks on this space adventure with the mastery that all that swell gave him.
He is a father of two, a boy and a girl, and can't live his life without sports: in addition to triathlon, he still finds time to surf and to practice SUP (Stand Up Paddle).

HERMÍNIA SARAIVA, COMMUNICATIONS OFFICER

Born in Angola, raised in Lisbon, Hermínia has always been fascinated by books, newspapers and magazines. She was a journalist for over two decades. Still, although always passionate about telling stories that involve people, she ended up entangled in the meshes of economic journalism, having been a senior reporter and editor at Diário Económico for most of her professional life. After turning 40, she thought it was time to start all over again. But now being paid to do what she has done whole her life for free: to have her head in the clouds.

INÊS D'ÁVILA, SPACE TRANSPORTATION & SPACE SAFETY OFFICER

With a Master's Degree in Aerospace Engineering (Instituto Superior Técnico, 2019), her passion for Space and Aeronautical worlds led her to participate in various competitions during her academic journey. Motivated by the several volunteering activities in which she participated, Inês always enjoyed helping the next one and hopes to keep on doing it in the future.
Passionate about challenges and seeing new projects coming to life, she embraced the foundation and leadership of the Técnico's Aerospace Engineering Students Nucleus – AeroTéc, being its president during the first two years and having participated in the most diverse projects.

JOAN ALABART, INDUSTRIAL RELATIONS & PROJECTS OFFICER

Joan Alabart is a Spanish MSc Civil Engineering from Universitat Politécnica de Catalunya who spent one year at TU Delft in an exchange program. He has over five years of experience in project engineering and project management in large international engineering projects (rail, road, maritime) combined with a life-long passion for space. This enthusiasm for the ultimate frontier together with his attachment to Portugal has brought him to Lisbon where he currently works as the Industrial Relations and Projects Officer at the Portuguese Space Agency with a focus on non-space applications. When he is not talking about the wonders that space brings to us, you might find him riding a flashy orange bike along the Tejo.

LUÍS SERINA, INDUSTRIAL POLICY & TECHNOLOGY OFFICER

Luís Serina holds a degree in aerospace engineering from the Technical University of Lisbon. He has been working in the Space sector for more than a decade. Since 2007 he has been working with the European Space Agency and the European Commission Space programmes as Portuguese representative on several boards and committees. He is the Portuguese delegate to ESA Industrial Policy Committee and Council. Until recently, he was learning to play tennis in his non-space free time. But currently, he intends to focus more on improving his cooking abilities. He is known as the best travelling companion, for carrying a bag that always has nuts.

MANUEL WILHELM, SPACE TRANS-PORTATION & EXPLORATION OFFICER

Even though his first name sounds Portuguese, Manuel Wilhelm is originally from the South of Germany. The mechanical engineer obtained his training mainly at the Technical University of Darmstadt, but also gathered experience at the Royal Institute of Technology in Stockholm (Sweden) and Virginia Tech in Blacksburg (USA). Apart from academia, Manuel got his feet wet working as an intern for Lufthansa Technik at Frankfurt airport. In 2020, he obtained his doctorate at the Technical University of Darmstadt. At Portugal Space, he is responsible for the field of Space Transport and Exploration.

MARTA GONÇALVES, SCIENCE & EDUCATION OFFICER

Marta Gonçalves always had a special interest in the functioning of things and a fascination for space, which proved to be the ideal combination. She ended up with a MSc in Aerospace Engineering (IST/Universty of Lisbon). The interest in people and the collective well-being was always present in the voluntary work she has done and later was extended to her professional life with the desire to contribute to space positively impacting society and economy. Before working at Portugal Space, she worked at IN+/IST as a researcher, studying the impact of technological change in the aerospace sector. At Portugal Space, Marta is an Science & Education Officer.

MÓNICA REIS, INTERNAL OPERATIONS MANAGER

A tough little cookie, Mónica has been on the workforce for more than 20 years. Although her field isn't Space, her eyes have searched the stars her whole life. With a degree in Psychology, her professional path was very diverse, helping her develop a constellation of skills.Her best personal achievement was creating an improved version of herself in the form of her daughter – maybe the first Portuguese astronaut. The highlight of her career was coming to work for Portugal Space. The incredible team and the common goal that unites them give her great motivation. If you visit, this will be the face welcoming you, reflecting the positive environment that Portugal Space lives.

NUNO GOMES, COMMUNICA-TIONS TRAINEE

Born and raised in Guimarães, Nuno moved to Lisbon to embrace the biggest challenge in his life (at least until now): to be a part of the Portuguese Space Agency, Portugal Space's communications department.
He studied communication and journalism in the Trás-os-Montes and the Minho regions, where he began his career as a freelance journalist, writing for three years for local and national newspapers. You will likely find him with headphones at any time of the day or drawing on his notebooks.
People often tell him his head is always up on the moon — and the astronaut tattooed on his arm can be a way to prove that.

PAULO BRAGA QUENTAL, SPACE TRANS-PORTATION OFFICER

Paulo Braga Quental, born in Azores 30 years ago, received his MSc in Mechanical Engineering from Instituto Superior Técnico – IST. Having started his professional career as a researcher at IST, he has held university management positions and was a lecturer in Engineering at that same institution. His professional experience ranges from the design of components for nuclear fusion reactors and thermal power plants to operational management. Before joining Portugal Space, he developed green transition solutions for the industry. His hobbies include cooking, preferably at low temperature (sous vide), electronics projects and keeping fit.

PEDRO COSTA, DUAL USE TECHNOLO-GIES OFFICER

Pedro Costa graduated in Electrotechnical Engineering and has a Master's degree in Security and Defence. With the rank of Lieutenant-Colonel in the Portuguese Air Force, Pedro is fascinated by Space above and below the Kármán Line. While waiting for his trip into Space, he let the attraction for space technology and its value for Humanity, both in terms of technological evolution and sustainability, guide his professional path. Until now he was a Space Specialist in the Air Force. Married and father of a daughter and a son, Pedro likes to regain his energy by escaping on motorbike trips or diving into the pages of a book.

SOFIA SOUTO, JUNIOR EARTH OBSERVATION PROJECTS OFFICER

Sofia Souto has a MSc in Geosciences from the University of Minho, having also attended the Universität Bremen. Her interest in mineral exploration and remote sensing lead her to come cross with Copernicus, the Earth Observation programme promoted by the EU. She worked as a field geologist and later as an intern at the Land Resources Unit at the JRC (EC). Currently, she seeks to combine science and technology with industry as JEOPO at Portugal Space. Whenever possible, she is living an outdoor adventure.

TIAGO PERES, SATELLITE COMMUNICATION & NAVIGATION OFFICER

Tiago Peres is a Satellite Communication and Satellite Navigation Officer at Portugal Space. His fascination for space and his ambition to build spaceships came up at a very early age. That's why sitting in the chairs of the Instituto Superior Técnico (Technical University of Lisbon) come as something natural. He left IST with a master's degree in Aerospace Engineering. Before arriving in Portugal Space, he accumulated technical experience in GNSS, working at Deimos Engenharia, and also as a consultant at Airbus Defence and Space and the European Space Agency.

SPACE CAPABILITIES

INDUSTRY

Competences	General Domain				Onboard Data Systems				Space Systems Software					
Industry	Software	Hardware	Services	Other	Payload data processing	Onboard data management	Microelectronics for digital and analogue applications	Other	Advanced Software technologies	Space segment software	Ground segment software	Ground data processing	Earth observation payload data exploitation	Other
ASM METAL			●											
Abreu Advogados			●											
Active Space Technologies		●	●											
Afipre			●											
Agroinsider			●											
Amorim Cork Composites				●										
Argo Baum Tech Precision			●											
Atlar Innovation	●													
BEEVERYCREATIVE		●												
Bluecover Technologies	●	●												
Bold Robotics	●	●	●						●			●	●	
Celestia Portugal	●	●	●								●			
Cosmos Pics	●												●	
Critical Software	●		●		●	●			●	●	●	●	●	
CybELE	●		●						●				●	
D-Orbit	●	●	●		●	●	●		●	●	●	●	●	
DEIMOS Engenharia	●		●		●	●			●	●	●	●	●	
EDISOFT	●	●	●		●	●			●	●	●	●	●	
Efacec		●												
Engenhotec			●											
Eptune Engineering		●	●											
EVOLEO Technologies	●	●			●	●	●			●		●		
Eye2Map			●										●	
FHP		●	●											
GEOSAT			●											
GMV	●		●		●	●			●	●	●	●	●	
Ilex Space			●											
K-1-DIGITAL	●		●											
LC-Technologies		●												
Localista Tech	●		●											
Lusospace		●												●
MATEREO	●		●											
ML Analytics	●								●	●	●	●		
Neuraspace	●				●	●			●	●	●	●		
OHB Portugal	●	●	●		●	●	●		●	●	●	●	●	
Omnidea		●	●											
Optimal		●												
Present Technologies			●											
RFA Portugal		●												
Ricardo & Barbosa			●											
Sintersa		●												
Sinuta		●					●				●			
Space Ballistics	●	●	●											
Space Engineer		●												
Space Layer Technologies	●		●											
SpaceWay	●		●							●			●	
Spin.Works	●	●	●		●		●			●			●	
Spotlite	●		●									●	●	
STRATOSPHERE	●	●	●			●	●		●	●				
TEKEVER		●	●		●	●				●	●	●	●	
Tesselo	●		●											
Ubiwhere	●								●					
Valispace	●							●	●					
VdA			●											

Competences	Spacecraft Electrical Power					Spacecraft Environments and Effects				Space Systems Control				
Industry	Power system architecture	Power generation technologies	Energy storage technologies	Power cond. and dist. Incl. regulation, control and dist.	Other	Space environment	Environment effects	Space weather	Other	Control systems engineering	Control systems innovative technologies	Control techniques and tools	AOCS/GNC sensors and actuators	Other
ASM METAL														
Abreu Advogados														
Active Space Technologies				●										
Afipre														
Agroinsider														
Amorim Cork Composites														
Argo Baum Tech Precision														
Atlar Innovation														
BEEVERYCREATIVE														
Bluecover Technologies														
Bold Robotics														
Celestia Portugal														
Cosmos Pics														
Critical Software										●		●		
CybELE														
D-Orbit	●			●		●	●			●	●	●	●	
DEIMOS Engenharia						●		●		●	●	●	●	
EDISOFT										●				
Efacec	●	●		●				●						
Engenhotec														
Eptune Engineering														
EVOLEO Technologies				●										
Eye2Map														
FHP														
GEOSAT														
GMV							●	●		●	●	●	●	
Ilex Space														
K-1-DIGITAL														
LC-Technologies														
Localista Tech														
Lusospace													●	
MATEREO														
ML Analytics										●	●	●		
Neuraspace						●								
OHB Portugal						●				●				
Omnidea		●	●							●				
Optimal														
Present Technologies								●						
RFA Portugal						●								
Ricardo & Barbosa														
Sintersa				●										
Sinuta														
Space Ballistics														
Space Engineer														
Space Layer Technologies														
SpaceWay						●	●	●					●	
Spin.Works										●	●	●	●	
Spotlite														
STRATOSPHERE		●		●		●						●		
TEKEVER	●			●						●			●	
Tesselo														
Ubiwhere														
Valispace														
VdA														

Competences	RF Systems, Payloads and Technologies						Electromagnetic Technologies and Techniques				System Design & Verification				
Industry	Telecommunication systems/subsystems	Radio navigation systems/subsystems	TT&C and PL data modulator (PDM) systems/subsystems	RF payloads	RF technologies and equipment	Other	Antennas	Wave interaction and propagation	EMC/RFC/ESD	Other	Mission and system specification	Collaborative and concurrent engineering	System analysis and design	System verification and AIT	Other
ASM METAL															
Abreu Advogados															
Active Space Technologies					●									●	
Afipre															
Agroinsider															
Amorim Cork Composites															
Argo Baum Tech Precision															
Atlar Innovation	●				●	●	●	●						●	●
BEEVERYCREATIVE															
Bluecover Technologies															
Bold Robotics															
Celestia Portugal	●		●		●		●							●	●
Cosmos Pics															
Critical Software	●										●	●	●	●	
CybELE															
D-Orbit	●		●						●		●	●	●	●	
DEIMOS Engenharia		●		●	●						●	●	●	●	
EDISOFT	●										●	●	●	●	
Efacec				●									●	●	
Engenhotec															
Eptune Engineering													●		
EVOLEO Technologies													●	●	
Eye2Map															
FHP										●					
GEOSAT															
GMV											●	●	●	●	
Ilex Space															
K-1-DIGITAL															
LC-Technologies					●	●	●								
Localista Tech															
Lusospace						●						●		●	
MATEREO															
ML Analytics															
Neuraspace															
OHB Portugal											●	●	●	●	
Omnidea											●	●	●	●	
Optimal	●														
Present Technologies															
RFA Portugal													●	●	
Ricardo & Barbosa															
Sintersa									●						
Sinuta	●			●	●		●						●		
Space Ballistics								●							
Space Engineer															
Space Layer Technologies															
SpaceWay	●	●		●	●						●	●	●	●	
Spin.Works											●				
Spotlite															
STRATOSPHERE									●			●	●	●	
TEKEVER	●	●	●	●	●		●				●	●	●	●	
Tesselo															
Ubiwhere															
Valispace											●	●	●	●	
VdA															

Competences	Mission Operation and Ground Data Systems				Flight Dynamics and GNSS			Space Debris				Ground Station Systems and Networks			Automation, Telepresence & Robotics				Life & Physical Sciences				
Industry	Advanced system concepts	Mission operations	Ground data systems (MCS)	Other	Flight dynamics	GNSS high-precision data processing	Other	Ground&space-based debris and meteoroid measur.	Modelling and risk analysis	Debris mitig., debris env. remediation and protection	Other	Ground station system	Ground communications networks	Other	Applications and concepts	Automation & robotics systems	Automation & robotics components and tech.	Other	Instrumentation in support of life sciences	Instrumentation in support of physical sciences	Applied life science technology	Applied physical science technology	Other
ASM METAL																							
Abreu Advogados																							
Active Space Technologies																●							
Afipre																							
Agroinsider																							
Amorim Cork Composites																							
Argo Baum Tech Precision																							
Atlar Innovation												●	●	●									
BEEVERYCREATIVE																		●					
Bluecover Technologies															●								
Bold Robotics															●	●	●		●		●		
Celestia Portugal																							
Cosmos Pics																							
Critical Software	●	●	●									●			●	●			●				
CybELE																							
D-Orbit	●	●	●						●	●			●	●	●								
DEIMOS Engenharia	●	●	●		●	●		●	●	●		●											
EDISOFT	●	●	●									●											
Efacec																							
Engenhotec																							
Eptune Engineering										●													
EVOLEO Technologies																	●			●			
Eye2Map						●																	
FHP																							
GEOSAT		●	●																				
GMV	●	●	●		●	●		●	●	●		●	●		●	●	●						
Ilex Space																							
K-1-DIGITAL																					●		
LC-Technologies											●	●		●						●			
Localista Tech																							
Lusospace														●				●					
MATEREO																							
ML Analytics	●	●	●						●	●					●	●							
Neuraspace	●	●	●		●				●	●													
OHB Portugal																							
Omnidea	●				●			●															
Optimal										●													
Present Technologies						●																	
RFA Portugal																							
Ricardo & Barbosa																							
Sintersa												●					●						
Sinuta												●											
Space Ballistics								●															
Space Engineer										●													
Space Layer Technologies																							
SpaceWay	●	●			●										●								
Spin.Works					●	●																	
Spotlite																							
STRATOSPHERE	●									●													
TEKEVER	●	●	●									●	●										
Tesselo																							
Ubiwhere													●										
Valispace																							
VdA																							

Competences	Mechanisms									Optics				Optoelectronics				Aerothermodynamics					Propulsion					Thermal				
Industry	Mechanism core technologies	Non-explosive release technologies	Exploration tool technologies	Control electronics technologies	MEMS technologies	Tribology technologies	Mechanism engineering	Pyrotechnic technologies	Other	Optical system engineering	Optical component technology and materials	Optical equipment and instrument technology	Other	Laser technologies	Detector technologies	Photonics	Other	Numerical methods	Ground-based facilities	Sensors and Measurement Techniques	Flight databases	Other	Chemical propulsion technologies	Electric propulsion technologies	Advanced propulsion	Supporting Propulsion Technologies and Tools	Other	Heat transport technology	Cryogenics and refrigeration	Thermal protection	Heat storage and rejection	Thermal analysis tools	Other
ASM METAL																															
Abreu Advogados																															
Active Space Technologies	●						●																					●				
Afipre																															
Agroinsider																															
Amorim Cork Composites																													●		
Argo Baum Tech Precision																															
Atlar Innovation																															
BEEVERYCREATIVE																															
Bluecover Technologies																															
Bold Robotics																															
Celestia Portugal																															
Cosmos Pics																															
Critical Software				●								●													●						
CybELE																															
D-Orbit	●	●		●			●			●		●										●			●						
DEIMOS Engenharia																															
EDISOFT													●			●															
Efacec				●						●				●		●				●											
Engenhotec	●						●																								
Eptune Engineering	●						●																					●		●		
EVOLEO Technologies				●			●																							●	
Eye2Map																															
FHP																												●	●		●	
GEOSAT																															
GMV			●	●																											
Ilex Space																															
K-1-DIGITAL																															
LC-Technologies																															
Localista Tech																															
Lusospace					●					●			●	●	●	●															
MATEREO																															
ML Analytics																															
Neuraspace																															
OHB Portugal										●																					
Omnidea							●				●											●	●	●	●			●		●	
Optimal																											●				
Present Technologies																															
RFA Portugal																															
Ricardo & Barbosa																															
Sintersa																															
Sinuta																															
Space Ballistics																		●	●	●		●								●	
Space Engineer																															
Space Layer Technologies																															
SpaceWay																						●	●		●						
Spin.Works		●			●					●		●						●													●
Spotlite																															
STRATOSPHERE	●										●				●			●		●								●	●	●	
TEKEVER		●																							●						
Tesselo																															
Ubiwhere																															
Valispace																															
VdA																															

Competences	Structures												EEE (electric, electromechanical & electronic) Components and quality		Environmental Control Life Support (ECLS) and In Situ Resource Utilisation (ISRU)			Materials and Processes								Quality, Dependability and Safety				Others			Services			
Industry	Structural design and ver. methods and tools	High-stability and high-precision S/C structures	Inflatable and deployable structures	Hot structures	Active/adaptive structures	Damage tolerance and health monitoring	Launchers, reentry vehicles, planetary vehicles	Crew habitation, safe haven and EVA suits	Meteorod and debris shield design and analysis	Advanced structural concepts and materials	Other	Methods and process for prod. ass. of EEE comp.	EEE component technologies	Other	ECLS	ISRU	Other	Novel materials and materials technology	Materials processes	Cleanliness and sterilisation	Space environmental effects on materials and processes	Modelling of materials behaviour and properties	Non-destructive inspection (NDI)	Materials and process obsolescence	Materials for electronic assembly	Other	System Dependability and Safety	Software quality	Product and quality assurance	Other	Industrial Production Processes	Visualization technologies for production and design	Other	Earth Observation	Telecommunications	Satellite Navigation	Other
ASM METAL																																			
Abreu Advogados																																			
Active Space Technologies		●								●																									
Afipre																															●				
Agroinsider																																●			
Amorim Cork Composites																		●																	
Argo Baum Tech Precision																															●				
Atlar Innovation																																●		●	
BEEVERYCREATIVE																																			●
Bluecover Technologies																																●	●	●	
Bold Robotics																																			
Celestia Portugal														●																					
Cosmos Pics																																●			
Critical Software																											●	●	●		●				
CybELE																																●			
D-Orbit	●								●																		●	●	●		●		●	●	
DEIMOS Engenharia																											●	●	●						●
EDISOFT																											●	●	●				●		
Efacec	●																												●		●				●
Engenhotec							●											●								●									
Eptune Engineering	●		●				●	●		●								●	●		●	●									●				
EVOLEO Technologies	●																																		
Eye2Map																																			
FHP	●	●	●			●	●		●	●								●	●	●	●		●						●		●				
GEOSAT																																	●	●	
GMV														●													●		●				●	●	●
Ilex Space																													●						
K-1-DIGITAL																																			
LC-Technologies																																			
Localista Tech																																			
Lusospace													●																●		●	●			
MATEREO																																			
ML Analytics																																			
Neuraspace																																			
OHB Portugal																											●	●	●						
Omnidea	●		●				●											●	●			●	●						●		●				
Optimal	●	●				●	●			●								●																	
Present Technologies																																		●	●
RFA Portugal	●						●			●									●												●				
Ricardo & Barbosa																															●				
Sintersa													●	●																					
Sinuta																																			
Space Ballistics							●		●																										
Space Engineer									●									●																	
Space Layer Technologies																																			
SpaceWay																													●		●				
Spin.Works	●	●	●	●						●																			●				●		
Spotlite																																	●		
STRATOSPHERE	●	●	●	●	●	●	●		●				●					●				●	●	●			●	●			●			
TEKEVER	●																										●	●	●		●	●	●	●	
Tesselo																																●			
Ubiwhere																																	●		
Valispace	●																																		
VdA																																			

RESEARCH CENTRES

Competences	Earth Sciences						Planetary Sciences							Astrophysics and Space Sciences						Spacecraft and Robotic Technologies												Communication and Navigation				Computing and Software				Instrument Technologies					Management and Economics		Space Law	Others
Research Centre	Atmospheric dynamics and composition	Carbon cycle and ecosystem	Sea level and ice	Solid Earth dynamics and natural hazards	Water cycle	Others	Astrobiology & Ocean Worlds	Geosciences	Planetary & Exoplanetary Atmospheres	Planetary Interiors & Geophysics	Earth observation payload data exploitation	Small Bodies of the Solar System	Others	Exoplanet Discovery and Science	Interstellar and Heliospheric Physics	Cosmology	Structure of the Universe	Space Weather	Others	Advanced Propulsion and Power	Structure analysis	Thermal analysis	Aerodynamics	Acoustics	Manufacturing	Autonomy (creation and optimization of SiC activity plans)	Avionics and Flight Software	Mobility & Robotics	Precision Formation Flying	Survivable Systems for Extreme Environments	Others	Telecommunications	Optical communications	Navigation	Others	Artificial intelligence	Lifecycle Integrated Modelling and Simulation	Mission System Software	Others	Detectors and Instrument Systems	In-Situ Planetary Exploration Systems	Large Aperture Systems	Spectroscopy	Others	Space business models	Space economy and economics	Space Law	Others
+ATLANTIC		●	●								●										●					●	●								●										
AeroEspaço				●																																								●		
AEROG																				●			●				●		●																		
AIR Centre		●		●							●																								●			●	●								
RAEGE	●		●	●				●		●																																				
C-MAST												●									●		●																	●				●		
C2TN		●		●	●	●		●								●	●		●	●										●								●			●	●				
C4G				●				●		●		●						●																					●			●					
CA3						●					●							●																	●		●								
CEAACP				●																																										
CEDIS																																												●	●
CEG		●	●	●	●	●		●																																					
CEiiA																					●		●		●										●											
CICGE								●			●				●			●			●														●		●		●		●				
CIMA		●	●	●	●			●			●																								●				●			●			
CITEUC				●	●	●		●		●		●			●			●															●	●										
CITEVE					●																●	●		●	●					●														
DETI																														●	●									●		●				
EaRSLab	●			●	●	●				●																																●				
ESA_LAB		●				●																																								
GAUMa																●																														
IA							●		●			●		●	●	●	●	●	●									●		●				●		●	●	●		●	●	●				
INEGI	●																	●		●	●		●				●		●							●			●		●					
INESC TEC			●					●													●					●	●				●				●			●	●						
IT					●				●		●	●		●	●					●	●		●			●	●		●		●				●	●	●		●	●	●	●			
IH			●			●																																							
IPN																																												●	●
IPFN																				●	●	●				●													●	●		●				
IPMA NOT	●	●			●																																								
IJP			●			●																																						●		
ISQ																				●	●	●		●								●													
LARSyS											●									●			●			●	●	●	●						●								●		
LIBPhys																																													●	
LIP												●			●	●		●					●																●	●		●				
PIEP																					●	●		●												●									
UCILER																																												●	
UPSAG	●		●						●			●																																		
WJCR																																													●

IMPRINT

The Portuguese Space Agency - Portugal Space was created in 2019 by the Portuguese government to implement the National Strategy for Space, Portugal Space 2030. The Agency's primary purpose is to promote and strengthen Space in Portugal, its ecosystem and value chain for the benefit of society and economy in the country and worldwide, acting as a business and development unit for research institutions, companies and other entities

The Portuguese Space Catalogue is the outcome of a survey launched to industry and academia to identify the national business and scientific actors operating in space. The Catalogue aims to increase the outreach of the Portuguese space ecosystem both within Portugal and internationally, serving as a working instrument for international and national professionals, both public and private, helping them identify potential Portuguese partners in Space activities.

To everyone who answered the survey and contributed to this Catalogue, our most sincere gratitude.

If you wish to be part of the Portuguese Space Catalogue, please reach us through our website **www.ptspace.pt**

PORTUGAL SPACE

EDITOR IN CHIEF

Hermínia Saraiva

CONTRIBUTORS

Inês d'Ávila, Joan Alabart,
Marta Gonçalves, Nuno Gomes,
Tiago Roque Peres

www.ptspace.pt
info@ptspace.com

GRAPHIC DESIGNER
Anett Krase

Digital version free download
at **www.ptspace.pt**

Cover: © unknown artist, freepik

Printed by
Gráfica Maiadouro,
Porto, Portugal
November 2021

PORTUGAL
SPACE