



AIR CENTRE
ATLANTIC INTERNATIONAL RESEARCH CENTRE

MANAGEMENT AND FINANCIAL REPORT 2020

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1. MESSAGE FROM THE CEO

As for all organizations in the world, the year 2020 for the Atlantic International Research Centre (AIR Centre) has been very special with the Covid-19 pandemic affecting institutions, companies, and people in a cruel way, turning strategic objectives into very difficult challenges to achieve. Despite this scenario of deep crisis in all sectors of society, with situations that have not been experienced in Europe since the Second World War, the AIR Centre has been able to achieve its strategic objectives for the year, with an important consolidation of its structure. Regarding the internal organization, working procedures were completed and an Enterprise Resource Planning software (ERP - Primavera) to support the financial and accounts matters was successfully implemented. The required team for the Marine Biodiversity Observation Network (MBON) Secretariat was recruited and started initial activities, in a similar way the initial staff for the scientific infrastructure - RAEGE was also recruited, with an increase of the human resources leading to a total AIR Centre team up to 20 employees. During 2020 the consolidation and extension of the AIR Centre Network was another important objective. Despite the fact that the situation was not favorable, important developments were achieved in this line with the official incorporation of Cape Verde and the signature of Memorandum of Understanding documents to link other countries like Norway, Colombia and Mexico to the existing network in both sides of the Atlantic Ocean. With respect to competitive projects, starting on 2019 and by the end of 2020 a total number of 70 proposals were submitted by the AIR Centre in different consortia with governmental institutions, Universities, Research Centers and companies from the partner countries. More than 20 projects were awarded to AIR Centre consortia for activities within the scientific agenda of the organization with a total budget for all teams over 30M€ and 1,6M€ of direct contribution from AIR Centre staff.

In parallel to the elaboration of proposals and the execution of projects, an intense activity in the organization of international events was performed by the AIR Centre during 2020 in spite of the difficult situation. The 6th High-Level Meeting in Philadelphia (Penn State University) was successfully organized in a virtual mode with the participation of 11 Ministers and the final signature of the "Philadelphia Declaration". In order to keep connected the AIR Centre Network, the series of "Networking Fridays" webinars were organized, they are today one of the most popular events of the Ocean community all around the world with the participation of outstanding leaders in the domains of ocean, space or climate

sciences as speakers and thousands of participants from more than 110 countries in the world. Regarding the financial issues, the result of the year 2020 was positive by around 5K€ and the Balance Sheet is solid with most of the active assets in cash.

With respect to the perspectives for 2021, we envisage the continuation of the main lines of activity and the same strategic lines. The further consolidation of the internal structure of the organization is one of the main objectives, with the completion of the internal procedures. An increase of the human resources is also expected to be compliant with all the AIR Centre objectives. The extension of the network is also projected with conversations with countries in both sides of the Atlantic and in the three continents. Regarding projects, a new set of proposals along the AIR Centre missions and scientific agenda shall be submitted during 2021. During 2020 the definition of the AIR Centre long-term strategic infrastructure was performed, it includes the installation of a *Direct Receiving Station* (DRS) to obtain data from several satellites with direct broadcast, the participation in the acquisition of two *Earth Observation* (EO) Satellites and the development of the Atlantic Constellation of small satellites within a setting of international collaboration. All above is part of the "Atlantic Pole to Pole Observation System of Systems" or APPOSS, which is the final long-term framework designed by the AIR Centre for the near future. During 2021 it is expected that some of those systems are implemented, in particular the DRS in Terceira Island - Azores, the acquisition of two EO Satellites and the beginning of the Atlantic Constellation user requirements and needs definition and design.

2. INTRODUCTION

The Atlantic International Research Centre (AIR Centre) is an international, networked organization in the Atlantic countries, aimed at promoting job creation and sustainable economic development based on the knowledge of the Atlantic regions. It addresses and integrates the areas of Space, Atmosphere, Ocean, Climate, Energy and Data Sciences and promotes North-South/South-North/North-North/South-South cooperation, in alignment with national, regional priorities and global challenges such as the United Nations 2030 Agenda for Sustainable Development, the Ocean Science Decade for Sustainable Development (2021-2030), the Paris Agreement and the Sendai Structure for Disaster Risk Reduction (2015-2030). The AIR Centre aims to advance science and technology on a transformative scale in the Atlantic regions and for this purpose, its structure is internationally distributed in a network, composed of several nodes that act in an arranged way in order to develop initiatives, projects and actions, integrated in the Atlantic area, taking advantage and enhancing the synergies between researchers, infrastructures, institutions and resources already existing, public and private, distributed throughout the Atlantic region. Portugal is the host of the AIR Centre, having established, in accordance with the Florianopolis Declaration¹, the Association for the Development of the AIR Centre - AD AIR Centre (hereinafter referred to as "AIR Centre"), which, as a non-profit institution based in Terceira Island, Azores and offices in Lisbon, aims to embody and execute the mission and goals of the AIR Centre. The AIR Centre implementation calendar (see Figure 1) has given rise to several High-Level meetings between the Government-Academia-Industry, involving participants at ministerial level from various countries on the Atlantic shores. In addition to the formally associated countries of the AD AIR Centre – i.e., Portugal, Spain, the United Kingdom, Nigeria and Cape Verde, there are other countries Involved – e.g., the USA, Brazil, South Africa, Sao Tome and Principe, Angola, Namibia, Ghana, as well as recently during 2020, Norway, Mexico and Colombia. The network continues to expand, and there have been several expressions of interest, collaboration and membership by other Atlantic nations.

¹ The Florianopolis Declaration was signed in the framework of the second high-level international meeting on "Atlantic Interactions", held on 20 and 21 November 2017 in Brazil, following the first meeting on the same theme, which took place on Terceira Island in the Azores in April 2017, and which aimed to discuss forms of international cooperation with a view to promoting the use of highly qualified human-resources and the sustainable development of Atlantic regions.

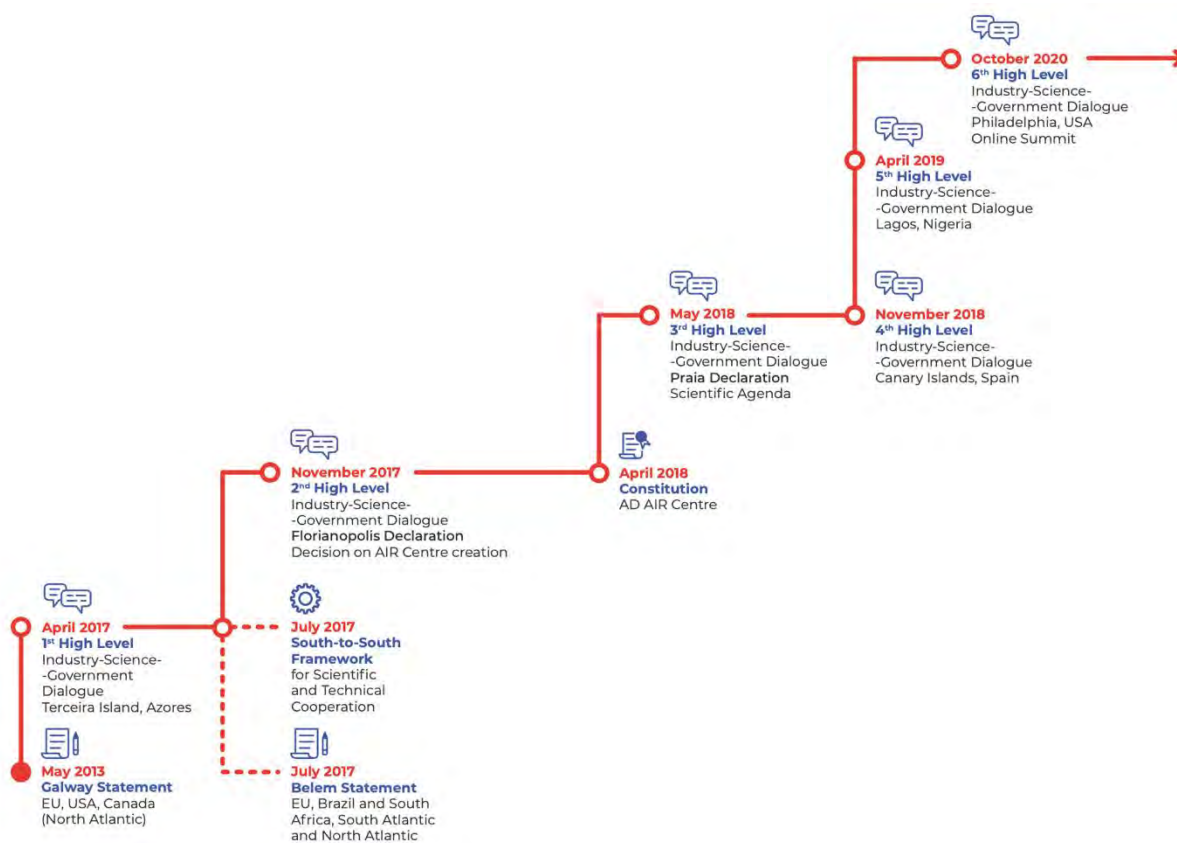


Fig. 1 - AIR Centre Implementation Calendar 2017-2020

3. GLOBAL CHALLENGES AND OPERATIONAL OBJECTIVES

The AIR Centre is a networked, collaboratively, and internationally distributed organization aimed at promoting and creating value and benefits for science, economy and the citizens of the Atlantic Area aligning with regional, national priorities and based on three major global challenges:

- climate change;
- Digital transformation; and
- Population dynamics related to income inequalities.

To achieve these global objectives during 2020, the AIR Centre has mainly proposed to strengthen research and innovation cooperation between Atlantic countries to address the challenges of developing a more integrated and connected sustainable blue economy in the Atlantic basin. The AIR Centre focused on strengthening scientific and technological collaboration between public and private entities in a wide range of areas related to Space, Atmosphere, Oceans, Climate, Energy and Data Sciences in the Atlantic. The AIR Centre develops its activities based on a scientific agenda aligned with (5) missions directed at promoting transdisciplinary and collaborative Research and Development (R&D) with Universities, Research & Engineering Centres, Institutions and/or Research Laboratories, also seeking to stimulate technology transfer and contribute to the projects continuum in the value chain to higher TLRs, for example with technology-based startups, small and medium-sized enterprises and industry in general in all regions of the Atlantic. The AIR Centre's scientific agenda is based on five (5) missions that are represented in Figure 2:



Fig. 2 – Five (5) AIR Centre Missions

For a broad understanding of the (5) missions of the AIR Centre, a summary description is referred to, as follows:



Clean and Productive Bays and Estuaries

Bays and estuaries are among the most productive areas on the planet, providing a wide range of basic ecosystem services valuable to the coastal population and wildlife. These areas are severely threatened by anthropogenic impacts (pollution, physical changes, habitat loss, urban sprawl) and environmental changes (rising sea level, rising water temperature, coastal erosion, ocean acidification). The AIR Centre will promote an approach based on an integrated ecosystem management of bays and estuarine areas and promote benchmarking and research & action for the preservation, restoration, and sustainable development of several key locations around the Atlantic Ocean.



Resilience to Coastal Natural Hazards

The frequency and severity of coastal hazards are expected to increase as a result of the combined effects of climate change and human activities. Risk prevention and reduction, as well as increased preparedness for the response to coastal hazards and vulnerability to natural or man-made disasters have become critical aspects for the well-being and safety of coastal populations and the preservation of wildlife. The AIR Centre will stimulate collaborative research on coastal resilience (with an emphasis on flood phenomenon, rising sea levels, extreme weather and coastal erosion) and will promote the development of warning systems to prevent loss of human lives and reduce the material and economic impacts of these devastating events.



Sustainable Food Production

Population growth is continuously increasing global food demand, raising concerns about the modification or destruction of coastal habitats, depletion of fish stocks and disruption of traditional subsistence chains of coastal communities across the Atlantic Ocean, among other growing concerns. The effective contribution of sustainable fisheries and aquaculture to mitigating these concerns should include a number of environmental, social and economic aspects with the aim to support innovative and inclusive value chains of marine products to reduce environmental risks and improve productivity. The AIR Centre will promote the development

of new technologies and innovative decision support tools for sustainable food supply and will also encourage partnerships with local communities, for example, to preserve traditional sustainable fishing practices and document relevant indigenous knowledge.



Improved
Management of
Marine and Coastal
Resources

Economic growth in recent decades has been achieved mainly through the unsustainable exploitation of many natural resources. This paradigm must be changed to maintain the integrity of the oceans and coastal areas for future generations. It is vital to ensure the integrity of the marine habitats and biodiversity they sustain, so that key ecosystem-based services can promote human well-being and continue to be provided.

The sustainable development of marine and coastal ecosystems can only be achieved if we plan for the future, ensuring long-term political commitment and the constant participation of all relevant stakeholders, from governments, civil society, industry and academia. The AIR Centre will build capacity for evidence-based governance of marine and coastal resources and contribute to raising awareness of local communities and decision-makers about the economic value of maritime spatial planning for sustainable development and preservation of marine and coastal ecosystems and biodiversity.



Improved
Environmental and
Maritime
Monitoring

The United Nations Decade of Ocean Sciences implementation plan for sustainable development shows that the vast volume of our ocean has not yet been mapped or properly observed, nor fully understood. Exploration and understanding of the key elements of changes taking place in the ocean, including its physical, chemical, and biological components, and interactions with the atmosphere and cryosphere are

essential, especially in a constantly changing climate. The AIR Centre will promote infrastructure data collection, with open and collaborative access, e.g., satellite data, in-situ observations, assimilative modelling, and artificial intelligence and will stimulate the implementation of satellite constellations, marine robotics, oceanographic ships and autonomous systems for open access data collection, storage and sharing.

Therefore, during 2020, the AIR Centre defined several operational objectives for the pursuit of its global challenges, which will continue to be implemented and consolidated during 2021, as the focus and its

determination are oriented towards strengthening the organization as a distributed network, of unique value and international reference for Atlantic Interactions in the large Atlantic area. However, as is of public knowledge, during 2020, the global community had to adapt and reinvent itself to overcome the worst pandemic of the 21st century, commonly referred to as COVID-19. The AIR Centre implemented a set of operational measures that were adjusted according to government decrees for pandemic control, both in the Continent and in the Azores. These measures were as follows:

- The health of the AIR Centre team and stakeholders considered a priority;
- Instructions, recommendations, procedures and contingency plans were defined, aligned with the policies of the pandemic procedures within of the Science and Technology Park – TERINOV (AIR Centre HQ) and the Secretariat General of Education in Lisbon;
- All AIR Centre resources followed a work rotation plan for the workplace, alternating between a limited period of physical presence in the facilities (both in TERINOV and in the Lisbon offices) and remote work;
- Continuity of operations, this to say, 100% operational with all human resources available, making use of the video and teleconferencing tools (e.g. zoom, ms teams, go meeting, etc...) for the continuity of activities at the internal level and interaction with the external stakeholders;
- Re-allocation of priorities and objectives;
- Replanning 2020 events for 100% online-mode.

The operational objectives set in 2020 were, as follows:

1. **Further consolidation of the internal structure:** integration of new human resources, based on an organization chart approved in the Board of Directors n. 12 (see Figure 3), availability and access to facilities (both at the headquarters in the Azores and in the offices in Lisbon), implementation of internal procedures to support management and administration (e.g. human resources management, project management and monitoring, documents management among other administrative support activities) and a planned and structured organization of the meetings of General Assembly, Board of Directors and the Executive Committee;

Organization chart in 2020

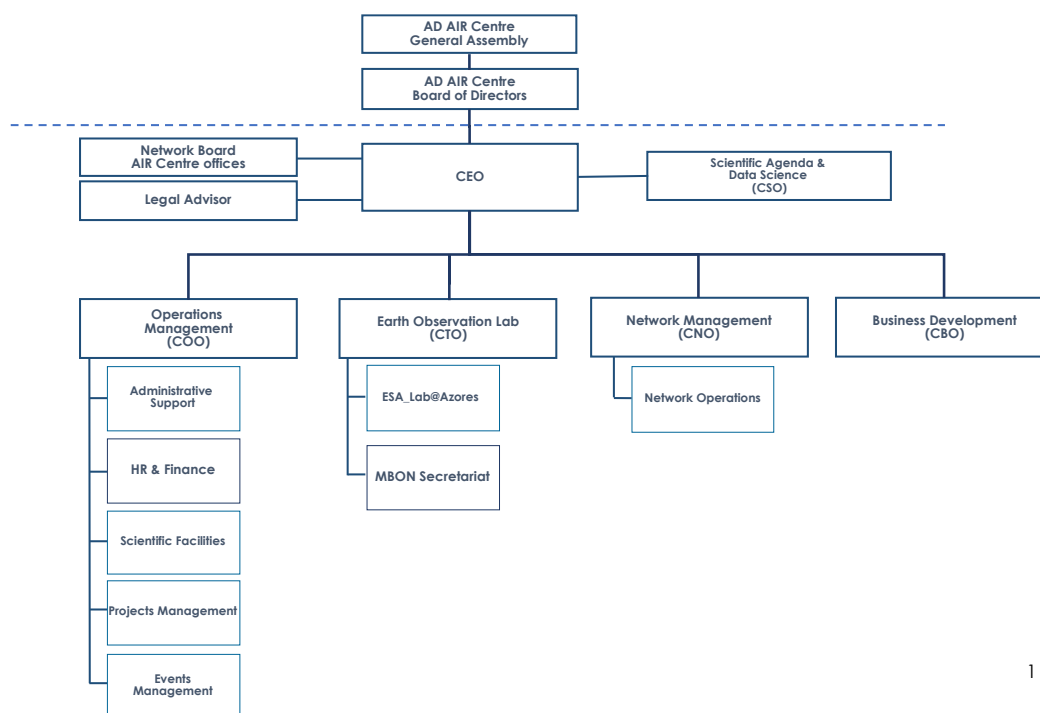


Fig. 3 - AIR Centre's 2020 organization chart

2. **Implementation of initiatives:** i) Earth observation laboratory – EO Lab (which is an ESA_Lab), ii) Secretariat MBON (Marine Biodiversity Observation Network), iii) Integration of human resources in scientific infrastructure - Santa Maria Geodetic and Space Station, A-RAEGE-Az, included in the Atlantic Network of Geodynamic and Space Stations, iv) Program for the award of PhD Scholarships 2020-2022, and v) Flagship Initiatives under the APPOSS vision, which include:

- Acquisition and installation of a Direct Receiving Station (DRS) for satellite data on Terceira Island;
- Coordination of the Atlantic Constellation;
- Coordination and participation in the acquisition of Earth Observation satellites: Deimos 1 and Deimos 2;
- Participation in the EEA Grants flagship project for the Atlantic Observatory (AO), where the AIR Centre aims at integrating the AO as a node becoming one of its key infrastructures;

3. **Extension of the AIR Centre network in the Atlantic:** the consolidation of the current network, the creation of new partnerships and agreements with Atlantic countries and the continued development of international cooperation with different stakeholders;
4. **Development of Atlantic-oriented projects:** the continuous implementation and execution of ongoing projects, including those initiated in 2019, and the design and preparation of new proposals for flagship initiatives with the AIR Centre network during 2020;
5. **Promotion of actions and events with regional, national, and international impact:** diffusion, dissemination, stimulation of social and economic impact, through the organization of events and other initiatives that promote active networking in the network and that increase the institutional visibility of the AIR Centre as an outstanding actor of the Atlantic Interactions.

4. RESULTS OF THE OPERATIONAL OBJECTIVES IN 2020

→ Progress in the consolidation of the internal structure

During 2020, internal procedures were implemented to ensure compliance with national legislation regarding public procurement, finance, and human resources. The progressive implementation of electronic administration means, the use and integration of management and administration systems have begun, favoring the improvement of the efficiency and quality of internal and external service, as well as knowledge management. The following results should be highlighted in this context:

- Transition to a new accounting service provider who started office duties during the first half of 2020;
- Digital operationalization of the financial management through the use of a platform-software for financial and accounting management designated: Primavera;
- Implementation in 2020/21 of the procedures: i) human resources management, ii) treasury management, iii) management control, iv) project management (from starting, monitoring and closure of the administrative, financial and operational procedures and commitments, v) GDPR;

Considering the atypical year of 2020, due to the COVID-19 crisis, the AIR Centre maintained a progressive dynamic in the hiring of new human resources. In January 2020, a total of eleven (11) employees, both in Azores and Lisbon, were part of the AIR Centre, and in December 2020 the total number of employees in the organization reached seventeen (17) (see Figure 4). Note should also be given of the integration of employees with a special regime, namely through the collaboration of two (2) external resources of a partner institution called CoLab +Atlantic, with technical and strategic contribution to the flagship initiatives of the AIR Centre, and another (1) employee integrated by the programme promoted by the Regional Government of the Azores, designated *Estagiar - L para jovens licenciados/mestrados* (L for young graduates/masters).

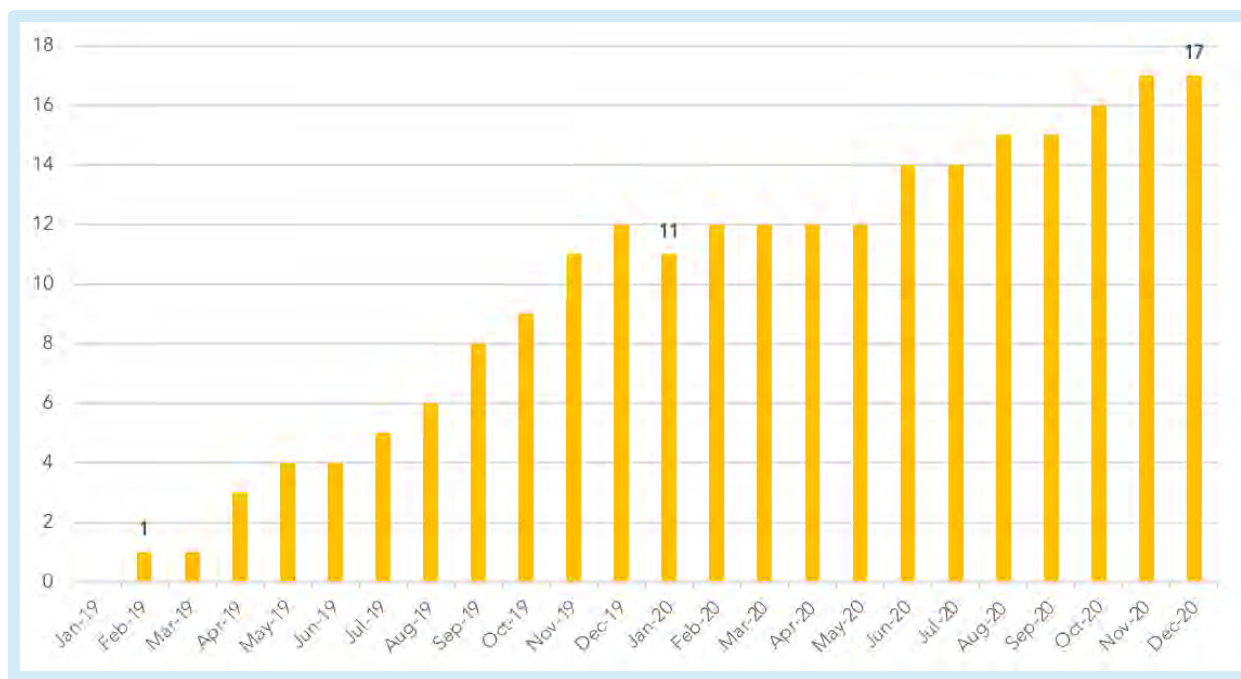


Fig. 4 – Evolution of HRs in the AIR Centre (2019-2020), except three (3) employees with a specific contractual setting

Regarding human resources qualifications in 2020, the distribution is as follows: five (5) PhDs, five (5) Masters, six (6) Graduates and one (1) with secondary school training (see Figure 5).

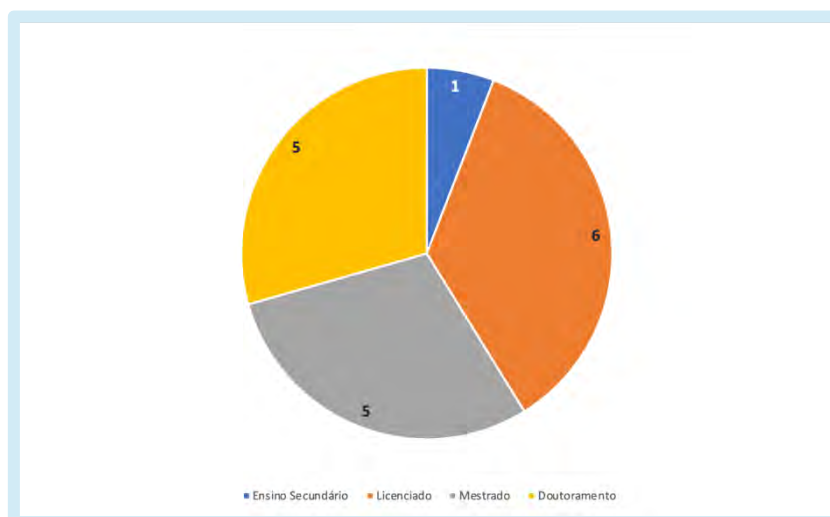


Fig. 5 – Distribution of AIR Centre HR qualifications in 2020

Regarding gender indicators in 2020, ten (10) of the total employees of the AIR Centre consists of female individuals (see Figure 6).

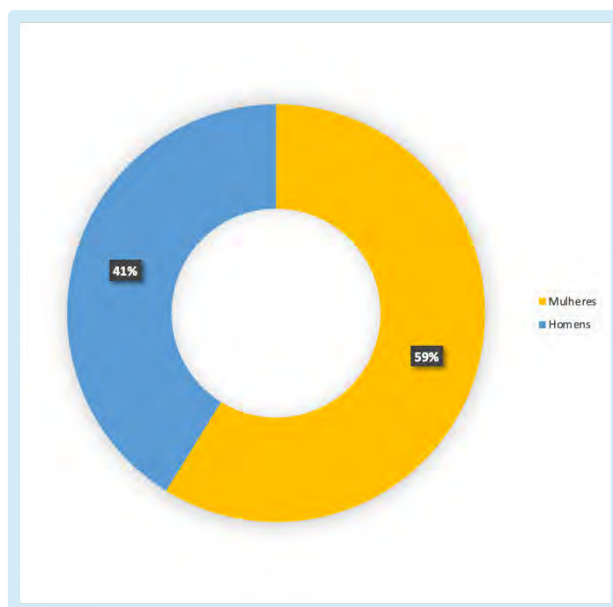


Fig. 6 – Gender indicators at AD AIR Centre in 2020

Regarding the planned and structured organization of the formal meetings of main AIR Centre committees in 2020, the General Assembly (GA) met three times during 2020 (see also Annex 1, members of the GA), having agreed on the following key topics for discussion and approval:

- **27th January 2020 (Extraordinary General Meeting)**
 - Appointment and hiring of the CEO: Miguel Belló Mora;
- **3rd April 2020**
 - Presentation, discussion and approval of the Management and Financial Report of 2019;
 - Presentation of the 2020 activity plan;
 - Presentation of risk mitigation measures and impact of the COVID-19 pandemic on AIR Centre activities;
- **23rd November 2020**
 - Presentation and approval of Cape Verde request to become a full member of the AIR Centre and representation in the GM;
 - Presentation of the main activities in 2020;
 - Presentation and approval of the provisional budget for 2021.

The Board of Directors (BoD) of the AIR Centre (see also Annex 2, members of the BoD) met regularly in 2020: on **24th March, 30th June, 09th November, 23th November and 22nd December** – always in articulation with the Executive Committee (EC) (the EC has an operational nature of the daily management decisions).

It should be noted that the meetings² of the BoD of 23rd November and 22nd December 2020 were extraordinary, with the following key topics for discussion and approval:

- Process of acquisition and installation of a "Direct Receiving Station, DRS" for satellite data at TERINOV facilities on Terceira Island, Azores;
- Process of acquisition of two (2) Earth Observation satellites to the Canadian company Urthecast: Deimos 1 (medium resolution – 20 meters) and Deimos 2 (high resolution – 75 centimetres) and the participation of the AIR Centre in subsequent actions towards the constitution of an entity that will operationalize the satellites, in collaboration with other partners;

The members that are represented in the governing bodies of the AIR Centre, apart from the CEO and the Statutory Auditor, do not receive any kind of remuneration, by decision of the General Assembly.

The CEO, the management team, the resources of technical/operational and administrative functions ensure the execution of all activities and tasks foreseen for the efficient functioning of the AIR Centre. This entails to continuously improve the effectiveness of procedures, including the prompt signing of the various agreements or contracts, the submission of project applications, the organization of regional, national and international events, missions to network stakeholders and other activities (e.g. advanced training for human resources), as well as the implementation of the activity plan, development of new processes and procedures always oriented to operational digitalization, and monitoring/orienting the work of the auditors based on compliance with applicable legislation.

² Extraordinary Board of Directors meetings refer to paragraphs 16 and 17, and these minutes are duly documented and signed.

4.1 EO LAB, MBON SECRETARIAT, A- RAEGE-Az, SCHOLARSHIP PROGRAM 2020-2022, FLAGSHIP INITIATIVES

→ Implementation of initiatives

4.1.1 EARTH OBSERVATION (EO) LAB

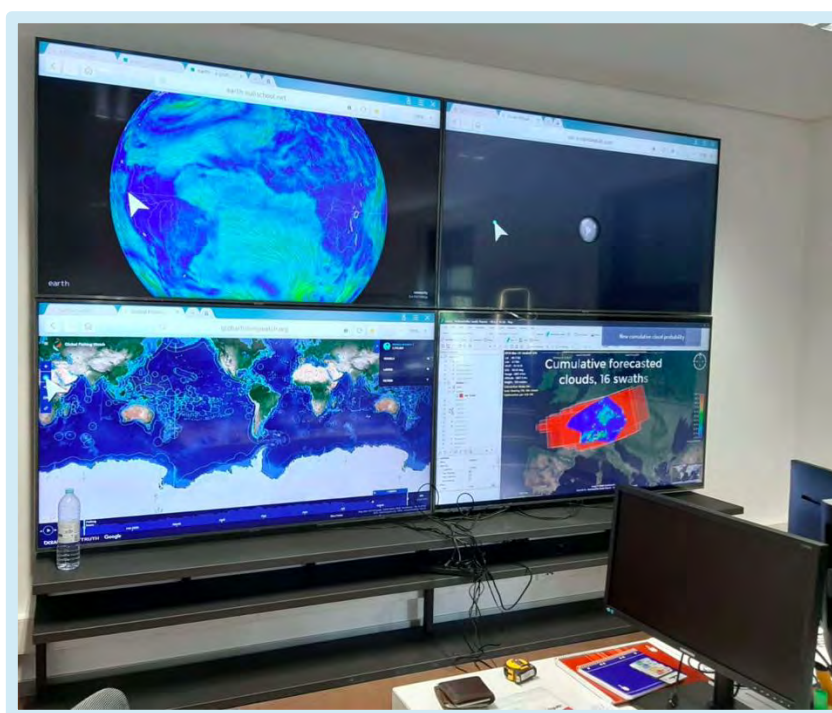


Fig. 7 – “Video-Wall” at the EO Lab facility in TERINOV

The Earth Observation Lab (EO Lab), located in the Science and Technology Park – TERINOV in Terceira Island, Azores, is established as an ESA_LAB @ Azores, a laboratory that aims to establish an institutional link between research entities and the European Space Agency (ESA) to explore innovative applications based on technologies and space observation systems for the Atlantic area. The EO Lab is also part of the Regional Blue Planet Thematic Observation Group (GEO) as well as the GEO-MBON (Marine Biodiversity Observation Network).

The EO Lab is operational since September 2019 and as of December 12, 2020, **has a total of eight (8) highly qualified human resources** with higher education at the PhD and Master levels in the areas of Biotechnology, Marine Biology, Computer Science, Oceanography, Biomedical Sciences and Aerospace and

Environmental Engineering. The EO Lab is installed in TERINOV, where the AIR Centre has three (3) rooms, aiming at the gradual growth of the team and its infrastructure. The EO Lab also established in 2020 an operational working methodology (see Figure 8, in workflow format) that allows a coherent approach to the various stakeholders in the design of ideas and projects and that integrates the vision of the AIR Centre for the flagship initiative, APPOSS (Atlantic Pole to Pole Observation System of Systems)

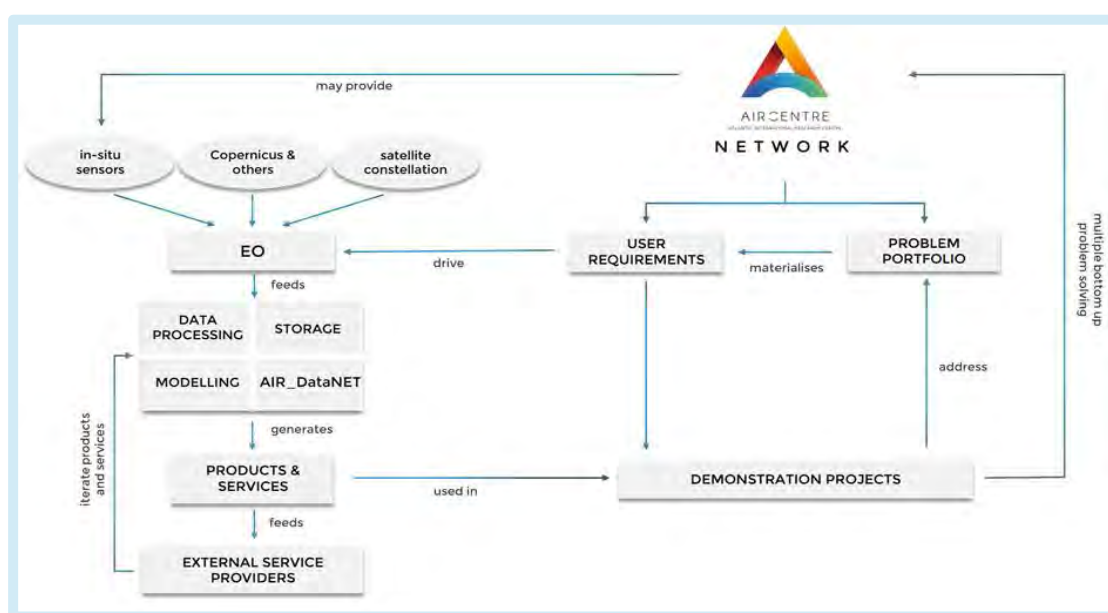


Fig. 8 – EO Lab operational methodology

In 2020, among the various results that have been achieved by the EO Lab, **it is pertinent to highlight three (3)**, as follows:

- I. Currently, the fungus *Pithomyces chartarum* is increasingly frequent in the pastures of Azorean cattle and when there is ingestion of grass with spores by cattle, there is a significant loss in milk production, discomfort of the animal due to photosensitivity and a reduced average life expectancy, with significant economic impacts for farmers. In line with this problem, an early warning system (see Figure 9) is already under development for the sporulation of *Pithomyces chartarum* on the basis of a geographical map of public access and with the incorporation of information on the state of pasture vegetation through satellite remote observation (using Copernicus satellites) and other scientific advances, in the area of Internet of Things (IoT), which will be essential for the full implementation of a system applicable to other islands, with a view to agricultural digital



transformation with greater precision, lower costs, greater profitability and more efficient resource management.

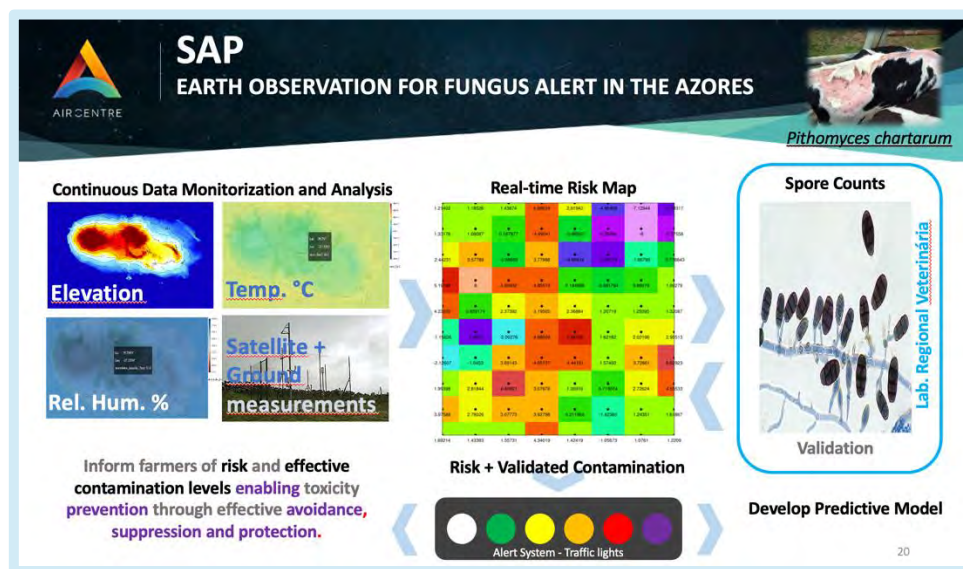


Fig. 9 – SAP, EO system workflow for the test of the fungus *Pithomyces chartarum*

- II. Considering and looking at the coming years the EO Lab will manage a significant volume of data (e.g. in the order of an annual traffic that could reach 45k terabytes per year), in 2020 began the devising and design of a **Data Centre** which includes the implementation of a computing infrastructure (i.e. network, servers for data management and storage, software/platform for Big data administration, among other activities that include hardware installation (see Figure 7, Video-Wall) for communication between the IT rooms/equipment to which the AIR Centre occupies at TERINOV facilities.
- III. During the pandemic period in 2020 mainly during the lockdown phase, the EO Lab implemented an initiative called: Covid-19 Observatory. This observatory resulted in **five (5) publications** regarding: air quality, water quality, air pollution and the normalized vegetation index (NVDI) for corn agriculture covering certain regions of Portugal. Further, by the end of 2020, the EO Lab prepared **one (1) scientific article** – "Air and Water Quality Improvement during the Covid-19 lockdown" (Silva p., Ávila M., Gonçalves M. 2020), (see Figure 10, article extract "Vertical column of nitrogen dioxide tropospheric (NO₂) in the Iberian Peninsula") to be submitted to an

International Conference: International Conference on Geographical Information Systems Theory, Applications and Management (GISTAM).

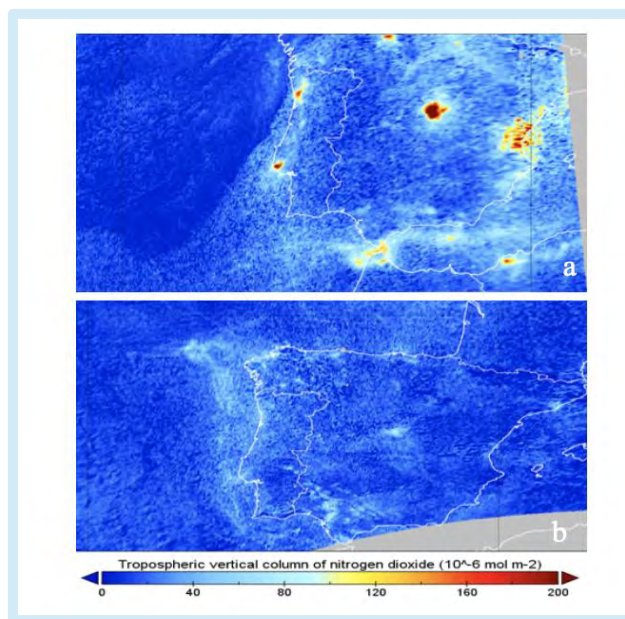


Fig. 10 - Tropospheric vertical column of nitrogen dioxide (NO₂) in the Iberian Peninsula on: a) 10 March 2020 eb) 28 March 2020.

4.1.2 MBON SECRETARIAT – MARINE BIODIVERSITY OBSERVATION NETWORK



The Marine Biodiversity Observation Network (MBON) is a "coalition of wills" that aims to share knowledge and know-how to assess biodiversity changes in the ocean, including data, products, protocols and methods, data systems and software, to inform and support ecosystem-based management and long-term health and the use of marine ecosystems.

MBON was established as a GEO-BON theme, supported by 110 member countries, to expand a global community to develop and share best practices and standards on how to collect and share data on ocean life. One of MBON's major challenges is to demonstrate the Essential Ocean Variables (EOVs) and the Essential Variables of Biodiversity (EVBs), which can be used to track changes in the ecosystem such as the abundance, distribution, and diversity of organisms in the ocean. The secretariat of the MBON network, is integrated at the AIR Centre's headquarters in the Azores and was the result of an agreement concluded in November 2018 between MBON, the AIR Centre and the Regional Fund for Science and Technology (FRCT)

in the Azores and activities were initiated at the start of the EO Lab in the last quarter of 2019. This partnership fosters scientific knowledge and the development of technology-based solutions using Earth Observation to contribute to effective management policies for ocean biodiversity and ecosystem services at the local level in the Azores, and internationally for the Atlantic community. **During 2020, the MBON Secretariat is 100% operational with two (2) highly qualified human resources dedicated to ongoing activities**, notably in the definition of a roadmap for the development of future and short-term MBON activities in the regional, national, and global context, as well as in the design of project proposals under the United Nations Decade of Oceanic Science for Sustainable Development.

4.1.3 A-RAEGE-Az

The national research, innovation, and growth strategy "Portugal Space 2030" aims, among other axis, to stimulate the exploration of space data and signals through space-based services and applications and empowered by space technologies, in which the location of the Azores assumes particular importance for its geostrategic position. In this context, the AIR Centre considers it important to leverage the existing infrastructure network in North-South/South-North cooperation in the Atlantic. The Atlantic Network of Geodynamic and Space Stations (RAEGE) incorporates an infrastructure of the terrestrial segment with potential scientific and technological growth, in which geodesy and geodynamics studies are being developed based on various observation techniques, in particular, the Very Long Baseline Interferometry (VLBI) geodetic, Global Satellite Navigation Systems (GNSS) and radio astronomy and Space Situational Awareness (SSA) studies. It is intended that the interconnection of A-RAEGE-Az with the AIR Centre shall result in various activities to be explored together, such as:

- the consolidation of an operational network/platform for monitoring Atmosphere-Ocean Interactions;
- joint activities between RAEGE, EO Lab and UMass Lowell University in the USA, in the fields of earth observation and space technologies;
- establishing a surveillance platform/network to leverage scientific leadership in the Atlantic;

- contribution to EU initiatives such as Space Situational Awareness (SSA) for the benefit of Europe and the Atlantic region.

The above are some of the activities defined preliminary with A-RAEGE-Az, but the scientific content of a detailed activity plan will be agreed between the RAEGE Scientific Board and the AIR Centre. **During 2020 the AIR Centre selected two (2) human resources at the level of PhD and Masters and that will be located at RAEGE infrastructure in the island of Santa Maria in Azores.** The first of this HR has already started functions in 2020, in close coordination with the EO Lab, and the second will incorporate during the first half of 2021.

4.1.4 PHD SCHOLARSHIP PROGRAM 2020-2022

In the first half of 2020, the AIR Centre signed a protocol with the Foundation for Science and Technology (FCT) with the goal of funding 20 (twenty) PhD research grants per year, over a three-year period in the fields of land and ocean observation, climate science and climate change, ocean health and marine pollution including the development of technological aspects, conservation of the marine environment and its biodiversity, the use and exploitation of its resources, the management and application of data, including the processing of large amounts of data, the application of artificial intelligence, robotics or emerging and innovative fields related to technological development and the blue economy. **During the last quarter of 2020, the AIR Centre announced an international competition (1st call) for the award of thirteen (13) PhD Scholarships, having received forty-two (42) applications.** The AIR Centre PhD Scholarship program aims to train the leaders of the future, with the following principles:

- strengthen scientific research and technological development capabilities of the AIR Centre network to better address national priorities and global challenges in the Atlantic region;
- strengthen existing collaborative ties and explore or develop new collaborative links between the AIR Centre and the Portuguese and International scientific community in areas of common interest;



- promote bilateral/multilateral cooperation between Portuguese scientific institutions and other institutions in various Atlantic countries by sharing inclusive knowledge and data to promote job creation, youth entrepreneurship and inclusive sustainable development;
- expand the reach of the AIR Centre mission agenda through broader engagement with academia to demonstrate the social relevance and public value of research;

The areas of PhD scholarships that were announced in the first call were the following:

Table 1- Areas of Doctoral Scholarships announced in the 1st call in 2020

1. Health: EO for Public Health
2. Health: Disaster Risk Reduction Strategies
3. Health: Air quality impacts using Earth Observation and GIS – Geographical Information System
4. Marine Robotics: Coordinated autonomous ocean and air vehicle
5. Marine Robotics: Marine Litter Detection and Collection
6. Marine Litter: Aerial surveys of estuarine and beach plastic litter
7. Numeric Modeling: Health Atlantic Basin
8. Numeric Modeling: Downscaling-Upscaling of Ocean Circulation models in the Atlantic
9. AIR DataNET: Research data management tools for the AIR_DataNet repository
10. AIR DataNET: Value-added services for the AIR_Data Net repository
11. Atlantic open data cubes: Concepts and tools for the Macaronesian region Data Cube
12. Air quality impacts using earth Observations and GIS – Geographical Information System
13. Adaptive Ocean Sampling and Mapping using Networked Marine Robots (surface and underwater vehicles)

4.1.5 FLAGSHIP INITIATIVES

The AIR Centre during 2020 has been conceptualizing an infrastructure that integrates the different sciences of Space, Ocean, Climate, Earth, Energy, and Data Sciences and which is designated as Atlantic Pole to Pole

Observation System of Systems (APPOSS) in order to promote an integrated vision for Atlantic observation(north-south/south-north/north-north/south-south). The APPOSS architecture includes seven components: Space, Atmosphere, Surface of the Sea, Underwater, Control Center, Data Management and End User Services (see Figure 11).

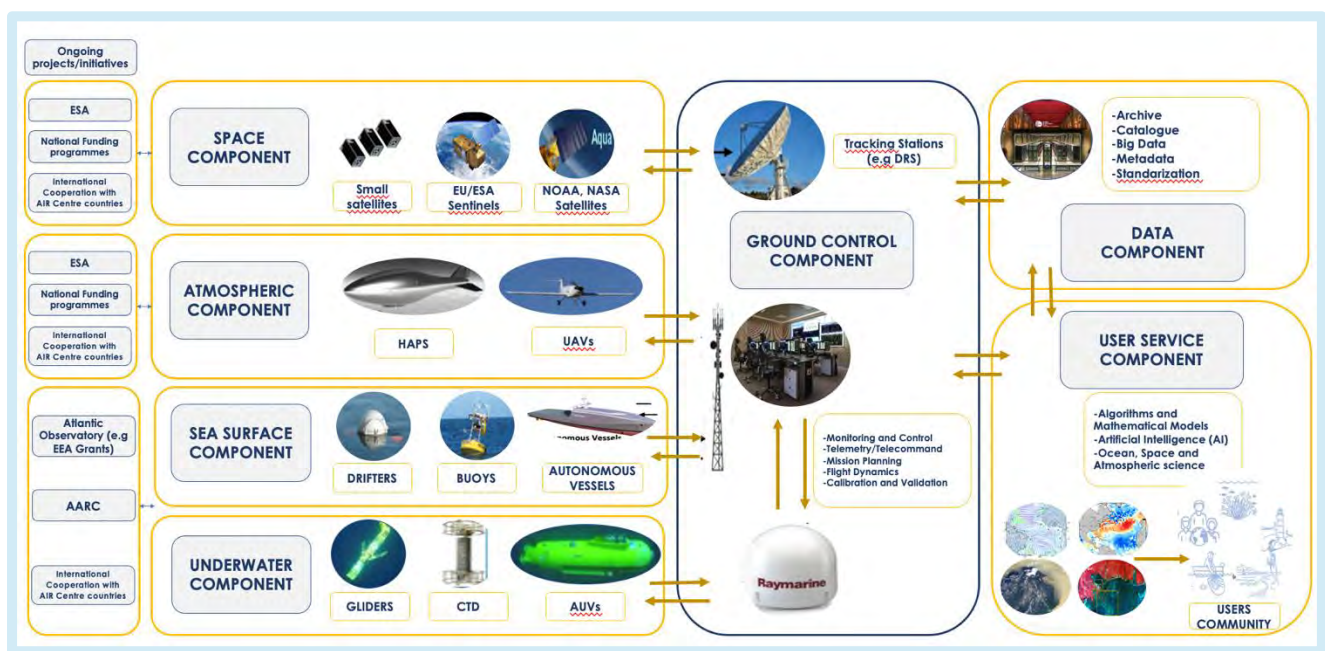


Fig.11 - Vision of architecture for Atlantic Pole to Pole Observation System of Systems (APPOSS)

4.1.6 COORDINATION OF THE ATLANTIC CONSTELLATION

The use of satellites in the "Space" component is absolutely fundamental, as it is an observation system that provides synoptic measurements due to its very wide field of view. Part of the Space component of APPOSS consists of satellites that provide free data existing in Europe (e.g. Copernicus program), the US (e.g. NOAA and NASA) and other national satellites from AIR Centre partners. The AIR Centre has been coordinating and contributing to the design of a Flagship project for the development of a constellation of small satellites called the **Atlantic Constellation**, in which it intends to unify its Atlantic network partners in a transatlantic partnership vision for a constellation that will provide important measurements with unprecedented frequency, which allows to develop innovative applications from Space to the Ocean, Earth, Climate and Atmosphere. Part of this constellation will be implemented in coordination with Portugal Space

Agency – Portugal Space, The European Space Agency (ESA) and the AIR Centre network countries that have been showing interest in collaborating.

The constellation project, and considering the evolution of specific strategic actions during 2020, it was defined the following configuration:

1. "upstream" which will be the development of small satellites (see Figure 12), of which:
 - a. Sixteen (16), in four orbital planes, integrating four (4) payloads (hyperspectral camera, GNSS-R system, AIS system and IoT module with 5G protocol), and with the terrestrial segment (e.g. terrestrial station, control and processing center) and launch;
 - b. Three (3), in an orbital plane, integrating two (2) payloads (multispectral high-resolution camera, and module for optical communications), and with the terrestrial segment (e.g. terrestrial station, control and processing center) and launching.

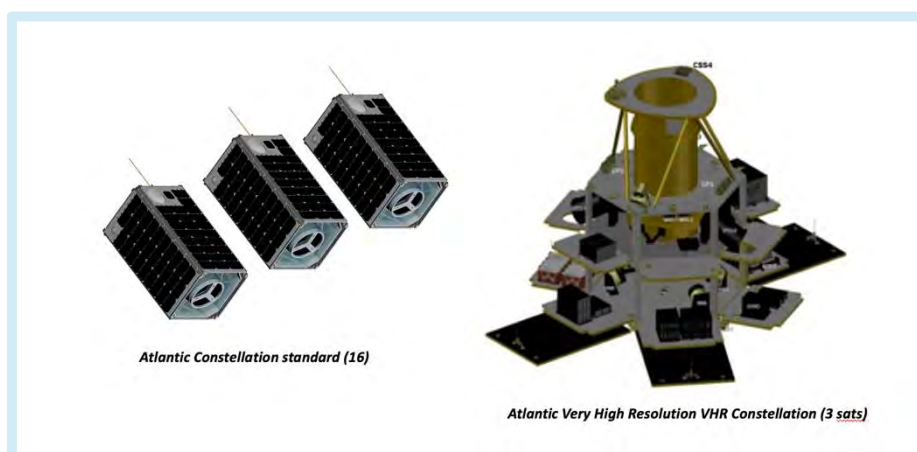


Fig.12 - Concept small satellites: 20kg platform - 16 satellites & platform 80kg - 3 satellites

2. "downstream" which will be the development of applications based on artificial intelligence, Big Data and other methodologies for providing effective services in the areas of oceanography, fisheries, agriculture, environment, natural disasters, renewable energies, smart cities of the future, etc. In this second part of development, studies by the most prestigious international consultants indicate that in the area of applications there is a multiplier factor that can reach the value of 10, so up to 1.500 highly qualified jobs can be created by the end of the decade in 2030, in

the areas of digital transformation, artificial intelligence, Big Data as a direct consequence of this project.

4.1.7 SATELLITE DATA DIRECT RECEIVING STATION (DRS)

The provision of near real time (NRT) information of Earth Observation data is a unique asset for different types of users and applications, both national and international. The local storage, at the AIR Centre's head office in the Azores, of this data also allows its access to regional, national, and international entities with very low latency times, enabling local processing for R&D purposes of new applications without the need to use other servers in other places in the world. (see Figure 13). Examples of real-time applications are: extreme weather events warning systems and natural disasters. Examples of users to these applications, can be research centres and universities, entities and local authorities (e.g. entities related to agriculture, forests, fisheries, meteorological services, among others) as well as industry, both established and startups (the latter for the development of new products and services).

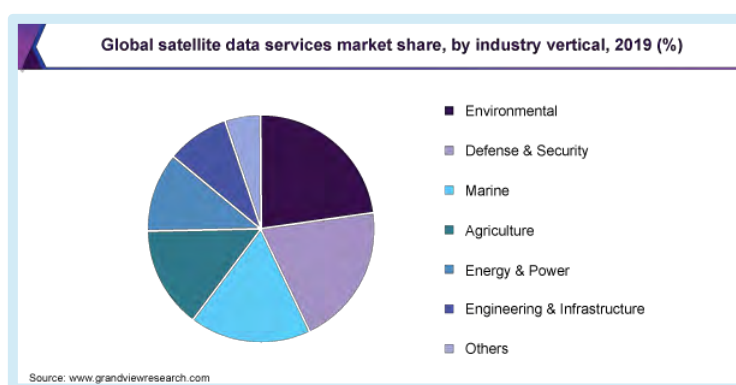


Fig 13 – Satellite data services by market segment

At the end of 2020 the AIR Centre BoD approved the acquisition and installation of a DRS station (see Figure 14) for data processing of satellites in the AIR Centre's premises at TERINOV. There are currently several satellites that provide satellite data for free (e.g. TERRA, AQUA, Suomi NPP, JPSS-1 (NOAA 20), Feng Yun 3-C and Fengyun 3D), and this dedicated ground-station called Direct Receiving Station (DRS) is capable of receiving this data. The operation of a DRS system can generate large volumes of data daily (in the order of Petabytes), that will be processed in real time at TERINOV facilities. The following example of one-day

operations includes 12 daily passes of the aforementioned satellites between 10:00 and 17:00 (and it is also possible to operate at night):

- Terra at 11:23 and 12:59 UTC
- Aqua at 14:38 and 16:19 UTC
- Suomi NPP at 14:00 and 15:41 UTC
- JPSS 1 at 13:13 and 14:51 UTC
- Feng Yun 3C at 10:47 and 12:29 UTC
- Feng Yun 3D at 13:37 and 15:16 UT

Assuming operations during the day and night, the antenna will be used about 4 hours a day, that is, an occupation that allows in the future the expansion to more satellites. The installation and operation of DRS capitalizes on the unique geography of the Azores that confers a unique technical and competitive advantage, because it allows access to this satellite data without time delay when compared to other DRS stations already installed in other locations, critically enhancing the development of NRT applications. Considering the above context, at the end of 2020 the Air Centre Board of Directors approved the process of acquiring/purchasing and installing a DRS station (see Figure 14) for processing and data processing operations of the satellites referred to in the AIR Centre's premises.

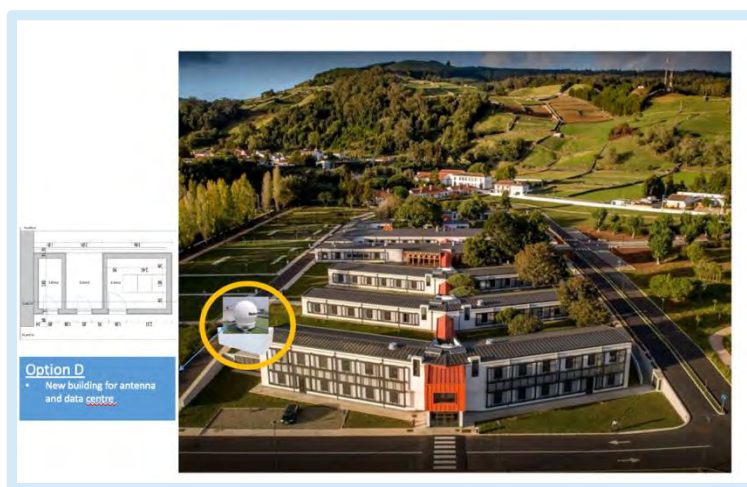


Fig 14 – Location for installation of the DRS station in TERINOV

4.1.8 COORDINATION AND PARTICIPATION IN THE ACQUISITION OF EARTH OBSERVATION SATELLITES: DEIMOS 1 AND DEIMOS 2

During the first week of September 2020, the Canadian company Urthecast, based in Vancouver, Canada and listed on the Toronto Stock Exchange, went bankrupt (Chapter 11). This company owns two Earth Observation satellites in Spain - Deimos 1 and Deimos 2 - through a subsidiary, Urthecast Spain.

The Urthecast Canada CEO, Don Osborne, contacted the AIR Centre to assess interest in acquiring these satellites. The Satellite Deimos 1 - is a medium-resolution optical satellite (20 m) originally designed for 5 years in orbit at 660 km altitude but is still in orbit after 11 years and in good technical condition. The Satellite Deimos 2 - is an Earth observation satellite of very high resolution and agile, capable of providing images with 75 cm of resolution in 4 bands (R, G, B and NIR) covering a range of 12 km, being the only European satellite capable of providing multispectral submetric images (see Figure 15).

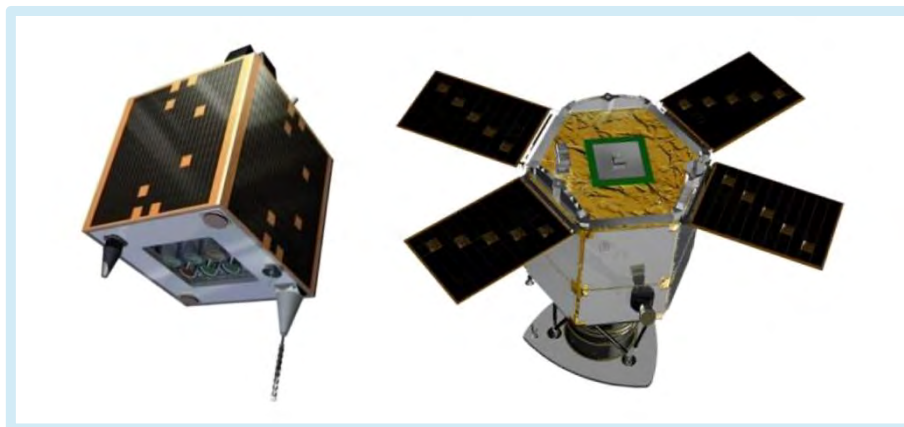


Fig 15 – Satellites Deimos 1 and Deimos 2 (from left to right)

To proceed with the satellite acquisition operation, the AIR Centre consulted the countries in its network that would be potentially interested in the acquisition of the satellites, looking at the financial availability to contribute to this operation. The countries approached were Portugal, Spain, Mexico, Norway, Brazil, the United Kingdom, South Africa and Nigeria. Due to the limited period for the execution of this operation (only a few weeks) and to prevent Urthecast's assets in Spain from being liquidated in an auction, the result of the consultation made by the CEO of the AIR Centre was the commitment to the operation of Portugal (through a business consortium), Spain, Mexico (via the Mexican Space Agency, in collaboration with a private company) and Norway (through the known ground-segment company, KSAT). It should be

underlined that during the last quarter of 2020, a rigorous due diligence process (administrative, technical, commercial) was carried out, with the support of two (2) law firms (in Portugal and Spain) regarding the legal issues of this operation. Although Brazil, the United Kingdom, South Africa and Nigeria were not formally involved in the first phase of satellite acquisition process, if the operation is carried out positively in 2021, they will be contacted again for a second phase to establish the appropriate collaboration structure (e.g. access to images at a fraction of the market price, among other collaboration models). Therefore, at the end of 2020, and bearing in mind the context briefly explained, **the BoD approved that the CEO of the AIR Centre continued with the commitment to coordinate and participate in the operation to be carried out in 2021 for the benefit of the AIR Centre and its partners in the field of Earth Observation and the exploration and dissemination of satellite data and images**, both at the academic and research levels as well as in the business context and other stakeholders in the private sector.

4.1.9 PARTICIPATION IN THE EEA GRANTS FLAGSHIP PROJECT AND ATLANTIC OBSERVATORY NODE

The Atlantic Observatory aims for the protection, research, monitoring, and socio-economic exploitations of the Atlantic maritime areas and is intended to be a node of the AIR Centre marine area. The Atlantic Observatory will thus be organized as a research infrastructure in the AIR Centre organization, promoting network collaboration of relevant marine authorities and research institutions, with strong involvement of the continent's research communities, the two Portuguese island regions (Azores and Madeira), and the involvement of AIR Centre network partners.

The Atlantic Observatory seeks to strengthen the development of research, monitoring and governance of the Atlantic, and it is expected to be installed on Faial Island, Azores. The Atlantic Observatory will allow the establishment of synergies with the European Multidisciplinary Seafloor Observatory (EMSO), as well as with the European Marine Biological Resource Centre (EMBRC) Portugal, both with operation in the Azores.

Part of the funding for the implementation of the Atlantic Observatory will be under EEA Grants, which the kick-off took place in December 2020, with a view to activities based on the creation and operation of

an integrated, efficient, low-cost and scalable marine observation system focused on the Atlantic basin, from ongoing global or regional initiatives, promoting networking among stakeholders, and acting as a single access data point, information and services associated with the Atlantic. Under this program, cooperation in research and innovation in the Atlantic Ocean basin will be strengthened, in particular strengthening the roles of Portugal, Norway and Iceland as actors in marine research, with a view to leveraging cooperation through Atlantic Interactions (North/South, South/North).

→ Expansion of the network in the Atlantic

During 2020 the process of consolidating and extending the AIR Centre network and the development of international cooperation in the Atlantic continued, and new partnerships and bilateral agreements were created. This cooperation resulted in the formalization of MoUs, affiliation agreements and protocols of intent, as listed in Table 2 below:

Table 2 - Agreements and MoUs signed in 2020

SIGNATORIES ENTITIES	COUNTRY	SIGNED BY:
Affiliation Agreement between AIR Centre and Ciimar	Portugal	Miguel Belló Mora, CEO AIR Centre and Vítor Vasconcelos President of the Board and Isabel Sousa Pinto, Member of the Board, Ciimar
Affiliation Agreement between AIR Centre and NTNU	Norway	Miguel Belló Mora, CEO AIR Centre and Anne Kristine Borresen Dean, Faculty of Humanities, Siri Granum Carson, Director , NTNU Oceans
Affiliation Agreement between AIR Centre and Instituto de Engenharias de Sistemas de computadores, Centro de Pesquisa e Desenvolvimento do Brasil - INESC P&D	Brazil	Miguel Belló Mora, CEO AIR Centre and Valdimiro Henrique Barrosa Pinto de Miranda, Presidente da Direção do INESC P&D Brasil
Memorandum of Understanding between AIR Centre and Centro Ciência LP	Portugal	Miguel Belló Mora, CEO AIR Centre and Miguel Viveiros, Coordenador Científico do Centro Ciência LP

Research and development contract between CEIIA and AIR Centre	Portugal	Miguel Belló Mora, CEO AIR Centre and Aloisio Leão Presidente do Conselho de Administração e por José Rui Felizardo, Vogal do Conselho de Administração
Memorandum of Understanding between AIR Centre and FEUP	Portugal	Miguel Belló Mora, CEO AIR Centre and João Falcão e Cunha, Director da FEUP
Memorandum of Understanding between AIR Centre and University of León	Spain	Miguel Belló Mora, CEO AIR Centre and Carlos de La Puente, Vice Chancellor of Research -University of Leon
Memorandum of Understanding between AIR Centre and ISU	France	Miguel Belló Mora, CEO AIR Centre and Juan Dalmau, President of ISU
Memorandum of Understanding between AIR Centre and Mexican Space Agency - AEM	Mexico	Miguel Belló Mora, CEO AIR Centre and Salvador Landeros Ayala, General Director of AEM
Memorandum of Understanding between AIR Centre and AAC Clyde Space		Miguel Belló Mora, CEO AIR Centre and Luis Gomes CEO - AAC
Confidentiality Agreement between Ubiwhere e o AIR Centre	Portugal	Miguel Belló Mora, CEO AIR Centre and Nuno Ribeiro COO da Ubiwhere Lda
Confidentiality Agreement between UrtheCast Corp and AIR Centre	Canada	Miguel Belló Mora, CEO AIR Centre and Peter Duggan, Vice President Programs - UrtheCast Corp
Memorandum of Understanding between AIR Centre and Universidad de Antioquia	Colombia	Miguel Belló Mora, CEO AIR Centre and John Jairo Céspedes, Rector Universidades
Memorandum of Understanding between AIR Centre and Thrusters Unlimited SAPI de C.V.THU	Mexico	Miguel Belló Mora, CEO AIR Centre and Benjamin Anajar, CEO
Memorandum of Understanding between AIR Centre e o INESC -TEC	Portugal	Miguel Belló Mora, CEO AIR Centre e Rui Carlos Oliveira, Administrador do INESC TEC
Memorandum of Understanding for the creation of AARC - between AIR Centre; Forum Oceano; Plocan; TMA	Portugal, Spain, USA	Miguel Belló Mora, CEO AIR Centre, António Nogueira Leite, Chairman Forum Oceano; Joaquin Brito, CEO Plocan; Michael B. Jones President TMA
Memorandum of Understanding between AIR Centre and Corporación Universidad de la Costa - CUC	Colombia	Miguel Belló Mora, CEO AIR Centre, Tito Jose Crissien Borrero, Rectot CUC

Cooperation Protocol between
União Federal, MCTI and AIR Centre

Brazil

Miguel Belló Mora, CEO AIR Centre, Ana Luisa
Albernaz, Diretora Museu Paraense Emilio Goeldi

4.2 PROJECTS APPROVED IN 2020

→ Development of projects in the Atlantic

During 2020, the AIR Centre established an operational strategy for implementing the Atlantic Interactions agenda, both in the national and international context, with the participation and elaboration of new project proposals with and within its network. **Between 2019 and 2020, around 70 proposals for international competitions were submitted**, always in consortium with our partners, namely companies, technology centres, universities, or public institutions from the member countries of the network. Consortia led by the AIR Centre, or in which the AIR Centre participates, **have already won around 20 projects, a number determined in 2020**, representing a total volume of more than € 35 million (of which € 1.6 million will be executed by the AIR Centre headquarters). The projects that were approved in 2020 (see table 3) were as follows:

Table 3 – Projects approved in 2020

PROJECT NAME	FUNDING AGENCY
Internationalization Plan (InterAIRSect) of Science and Technology Azores	PO Azores 2020
LABPLAS: Land-Based Solutions for Plastics in the Sea	European Commission (EC)
Atlantic Regional Initiative: Cities and Ports	European Space Agency (ESA)
Atlantic Regional Initiative: Offshore Wind Energy	European Space Agency (ESA)
NextOcean: Next Generation of Fishing and Aquaculture Services	European Commission (EC)

Port XXI: Space Enabled Sustainable Port Services	European Space Agency (ESA)
FPA-CUP: Copernicus User Uptake Training for PT local users	European Commission (EC)
FPA-CUP: Copernicus for Nigeria Fisheries (grant agreement under preparation)	European Commission (EC)
FPA-CUP: Foster interaction between SMEs and End users for Copernicus products in Portugal (grant agreement approved, to be signed)	European Commission (EC)
FPA-CUP: Support SMEs to contact with end users in 4 different Atlantic Countries (grant agreement approved, to be signed)	European Commission (EC)
Mission Atlantic: Mapping and assessing present and future status of Atlantic marine ecosystems under Climate Change and Exploitation	European Commission (EC)
ASTRAL: All Atlantic Ocean Sustainable, ProfiTable and Resilient AquacuLture	European Commission (EC)
CE2COAST: Downscaling Climate and Ocean Change to Services - Thresholds and Opportunities	Foundation for Science and Technology (FCT)
AEROS: Constellation Development of a nanosatellite platform as a precursor of a future constellation to leverage the space/ocean scientific and economic synergies	PO Azores 2020
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	PO Azores 2020
K2D: Knowledge and Data from the Deep to Space	PO Azores 2020

As mentioned above, in Chapter 3, the five (5) missions of the AIR Centre support the Atlantic cooperation strategy and, in this context, the graph below (see Figure 16) illustrates how ongoing projects align with the AIR Centre missions.

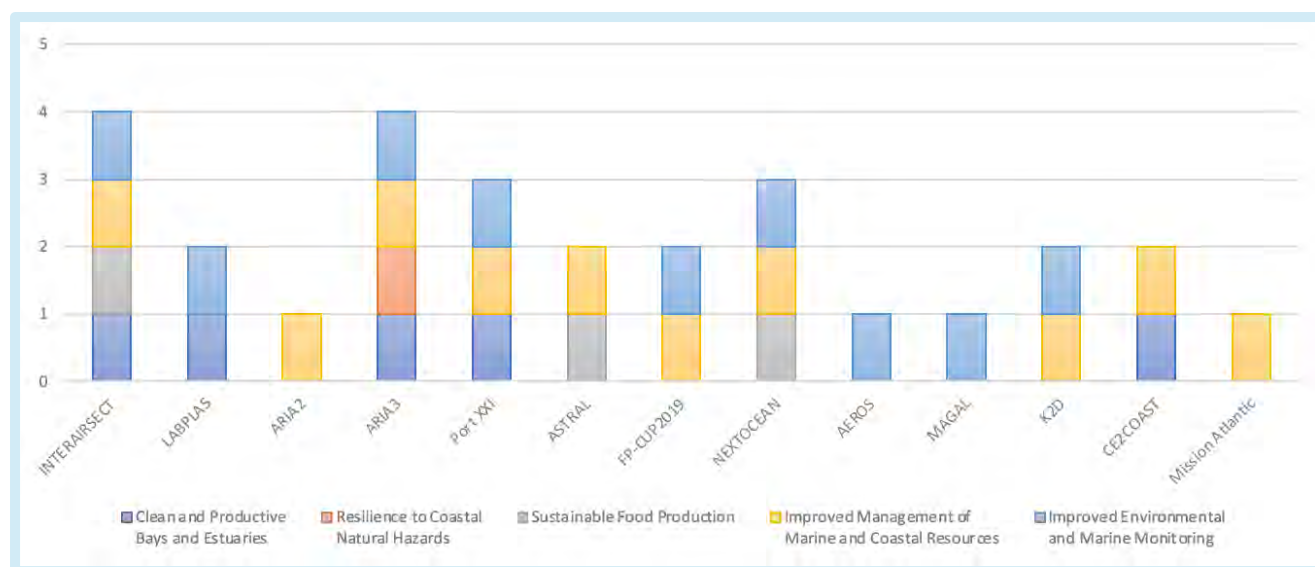


Fig. 16 – Alignment of the projects and the five (5) AIR Centre missions

4.3 EVENTS HELD IN 2020

→ Promotion of events with national and international impact

The AIR Centre held, co-held or participated in a set of events that promoted active networking and the creation of new opportunities for collaboration and increased the institutional visibility of the AIR Centre as a main actor of the Atlantic Interactions. The table 4 briefly describes each event and is further description is published in detail on the AIR Centre website:

Table 4 – Events held in 2020

DATE	LOCATION/COUNTRY	CONTINENT	EVENT DESIGNATION
11/01	Tenerife, Spain	Europe	Circum-Navigation, Workshop about Affordable Marine Robotics
21/01	Praia, Cape Verde	Africa	Circum-Navigation, Workshop about Biodiversity of Macaronesia

22-23/01	Bermudas	North America	Bermuda Space Sustainability Workshop
26-30/01	Tromso, Norway	Europe	2020 Arctic Frontiers "Power of Knowledge"
06-07/02	Brussels, Belgium	Europe	All Atlantic Research Forum
13/02	Rio de Janeiro, Brazil	South America	Circum-Navegação, Workshop about Metocean Modelling
02-03/03	Lisbon, Portugal	Europe	Space, Coastal Zones and Territorial Monitoring: responding to climate emergency
23-25/09	Salvador da Bahia, Brazil (online)	South America	II Fórum Internacional do Meio Ambiente e Economia Azul
05-09/10	Penn State, US (online)	North America	All-Atlantic Summit – 6 th HLD
26-28/11	Brazil (online)	South America	Congresso Brasileiro de Direito do Mar
03-04/12	South Africa (online)	Africa	All Atlantic Research Forum

→ Networking Fridays

The Networking Fridays webinar series started on April 24th, 2020, as a way to bring people together during a time of uncertainty and social distancing, resulting from the Covid-19 pandemic restrictions. The sessions take place every week on Fridays and provide the opportunity for researchers, innovators/entrepreneurs, representatives of multilateral organizations, government officials and entrepreneurs to informally discuss their work with the audience and explore ways of future collaboration. The statistics regarding the participation of the Atlantic community in Networking Fridays 2020, are referred in table 5 below.

The first session was attended by Gregory Jenkins, professor of Atmospheric and Meteorological Science at Penn State University and Director of the Penn State Alliance for Education, Science, Engineering & Design with West Africa, who shared his work on improving observation and forecasts on air pollution in West

Africa by bringing together Earth observation, numerical modelling and innovative low-cost sensors, and also Jerry Miller, President of Science for Decisions, who collaborates with the AIR Centre on connecting the U.S. at the strategic and scientific levels, and whom was the moderator of this 1st session. In 2020, the first session of Networking Fridays had an important symbolic meaning, since the organization of the **6th edition of the High-Level Dialogue of the Atlantic Interactions** was held in partnership between **Pennsylvania State University and the AIR Centre**. This event took place during the week of **5th – 9th October 2020** and involved more than **700 participants from 53 countries** and about **70 speakers**. During this event, the **Philadelphia Declaration** was also signed by **Ministers from ten countries: Portugal, Brazil, Spain, Cape Verde, Sao Tome and Principe, Angola, South Africa, Norway, United Kingdom and Nigeria**.

The goal of Networking Fridays is to keep the network active, connected and informed about activities of interest that are taking place in the Atlantic region. **During 2020, charismatic speakers and moderators from the Atlantic community participated and interactive discussions were held with thousands of proactive participants from more than 100 countries globally**. Recordings of the sessions are available on AIR Centre's Youtube channel.

During the year 2020 the following Networking Fridays sessions took place:



24th April – Greg Jenkins (Penn State's AESEDA)

Addressing Air Quality and Public Health using Earth Observation in Africa

Moderator: Jerry Miller (Science for Decisions)

8th May – Samuel Mafwila (SANUMARC)

*Sustainable Aquaculture and Fisheries Development in Southern Africa:
The Namibian Case*

Moderator: Stewart Bernard (CSIR)





15th May – Milton Kampel (INPE)

Remote Sensing Applications in Ocean Monitoring, Corals and Mangrove Studies

Moderator: Sofia Cordeiro (FCT)

22th May – Isabel Sousa Pinto (CIIMAR / GEO MBON)

Marine Biodiversity Observations: how to address the global scale?

Moderator: Sheila Heymans (EMB)



28th May – Olívia Oliveira (IGEO / UFBA), Antonio Fernando de Souza Queiroz (UFBA) and Icaro Thiago Andrade Moreira (UFBA)

Multivocational Profile of the Geosciences Institute of the Federal University of Bahia: Technical, Scientific and Academic Context

Moderator: Samuel Djauidnia (GEO Blue Planet)

5th June - Yasser Omar (IST UL)

LEA – Listening to the Earth under the Atlantic

Moderator: Jose Barros (ANACOM)



15th June – Sheila Heymans (EMB)

25 Years of Enabling Marine Science in Europe

Moderator: Wendy Watson Wright (OFI)

19th June - Suleiman Sadiku (FUTMINNA)

Towards a Viable Blue Economy for Sustainable Development: Floating Aquafeed and Allied Advances in Research and Development – the Case of Nigeria

Moderator: Asma Ibrahim (NASRDA)





26th June - Special Thematic Session on Sensors

Matthew Mowlem (NOC), Frank Muller-Karger (USF / GEO MBON), Eric Delory (PLOCAN) and Marcelo Pias (FURG)

Moderator: Elisa Ravagnan (NORCE)

3rd July - Paolo Corradi (ESA)

Monitoring plastic marine litter from space

Moderator: Kostantinos Topouzelis (University of the Aegean, Greece)



10th July - Sigi Gruber (DG RTD EC)

The All-Atlantic Ocean Research Alliance

Moderator: Peter Heffernan (former CEO Marine Institute Ireland)

17th July - DK Osseo-Asare (Penn State's AESEDA)

Technology Systems, Architecture and Integrated Design

Moderator: Filipe Addor (NIDES / UFRJ)



24th July - Minister Paulo Veiga, Cabo Verde

Setor da Economia Marítima em Cabo Verde

Moderator: Gui Menezes (Secretary for the Sea, Science and Technology, Azores)

31st July - Special Thematic Session on Sargassum

Cesar Toro (IOCARIBE), Karima Degia (UWI), Sandra Ketelhake (AtlantOS / KDM), Isabel Sousa Pinto (CIIMAR / GEO MBON) and Leah Mupas Segui (GEO Blue Planet)

Moderator: Emily Smail (NOAA, GEO Blue Planet Initiative)





14th August - Minister Maria do Rosario Sambo, Angola

Contribution of scientific research to the COVID-19 approach in Angola – a challenge for funding science

Moderator: Susana Catita (Ciência LP)

21st August - Danielle Wood, MIT Media Lab

Sustainability on Earth and in Space – Research by the Space Enabled Research Group at the MIT Media Lab

Moderator: Hayley Evers-King (EUMETSAT)



28th August - Special Thematic Session on Ocean Best Practices

Jay Pearlman (UNESCO / IOC), Pier Luigi Buttigieg (UNESCO / IOC), Rachel Przeslawski (Geoscience Australia), Juliet Hermes (SAEON) and Alison Clausen (UNESCO / IOC)

Moderator: Frank Muller-Karger (USF / GEO MBON)

4th September - Gordon Campbell, ESA

The Atlantic Regional Initiative

Moderator: Piero Messina (ESA)



11th September - Sergio Rossi, University of Salerno, Italy

Marine Forests and their Role in the Oceans

Moderator: Eduardo Pereira (IBS-S / ISISE)

18th September - Argyro Kavvada, NASA

The Sustainable Development Goals Using Earth Observations

Moderator: Samy Djavidnia





25th September - Special Thematic Session on Space Capacity Building

Stefano Ferretti (ESA), Shubha Sathyendranath (Plymouth Marine Laboratory) and Antonio Martelo (DLR)

2nd October - Martin Visbeck, GEOMAR

The Future Ocean Sustainability – From Ocean Observation towards Sustainable Development

Moderator: Isabel Sousa Pinto (CIIMAR)



9th October - Carlo Fezzi, University of Trento

The Economic valuation for spatial targeting of coastal ecosystems' conservation in the face of climate change

Moderator: Malik Lopes (Instituto do Mar, Cape Verde)

16th October - Luiz Paulo Assad, LAMCE / COPPE-UFRJ

The Environmental Numerical Modelling Developments and Initiatives: at the AIR Centre | Rio de Janeiro

Moderator: Ramiro Neves (IST)



23rd October - Filomena Vaz Velho, INIPM, Angola

The LuandaWaterFront Project – Luanda Bay Ecological Assessment: A waterfront based approach to reduce environmental risks and increase quality of life

Moderator: Marcelo Rollnic (Federal University of Para, Brazil)

30th October - Special Thematic Session on African Marine and Coastal Operational Services

Tidiane Ouattara (AUC), Kwame Agyekum (UG), Islam Abou El-Magd (NARSS), Oomarsing Gooroochurn (MOI), Marjolaine Krug (DEFF), Bolelang Sibolla (CSIR), Greg Duggan (ABALOB)

Moderator: Stewart Bernard (SANSA)





6th November - Zita Martins, IST

Astrobiology: Origin and detection of life in the solar system

Moderator: Gaia Stucky de Quay (UTexas)

13th November – Dava Newman, MIT

Physics-informed GANs for coastal flood visualization, with the collaboration of her students, Björn Lütjens, Brandon Leshchinskiy, Christian Requena-Mesa, Farrukh Chishtie, Natalia Díaz-Rodriguez, Océane Boulais, Aaron Piña, Alexander Lavin, Yarin Gal, Chedy Raïssi

Moderator: Marco Tedesco



20th November – Olanike Maria Buraimoh, University of Lagos

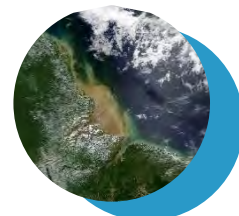
Circular Economy: A Sustainable and Preventive Strategy for the Alleviation of Atlantic Ocean Pollution

Moderator: Isa Elegbede

27th November - Special Thematic Session on Coastal Research in Amazonia

Pedro Walfir (ITV & UFPA), Marcello Rollnic (LAPMAR), Nils Asp (IECOS, UFPA)

Moderator: Sury Monteiro (UFPA)



4th December - Kwame Agyekum, UGhana

The Challenges in the fisheries sector with Earth Observation

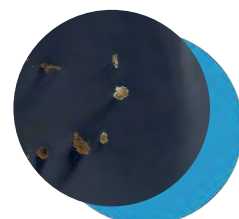
Moderator: Alice Soccodato (GEO MBON / AIR Centre)

11th December – The Biodiversity of Cabo Verde

Aline Rendall (INIDA) and Rui Freitas (UTA)

Brief Remarks: Miguel Belló Mora (AIR Centre), Raffaella Gozzelino (UTA), Malik Lopes (IMar), Maurício Guedes (FAPERJ)

Moderator: Teresa Amaro (University of Aveiro)












18th December - The Ocean Decade: a framework for transformative change at the regional and national level

Vladimir Ryabinin (IOC), Minister Manuel Heitor (Minister of Science, Technology and Higher Education, Portugal), Susanne Moser (IOC), Cesar Toro (Western Tropical Atlantic Regional Planning Group), Karen Silverwood-Cope (Brazil National Committee), Taylor Goelz (NOAA), Alison Clausen (IOC)

Moderator: Luís Pinheiro (Portuguese Committee for IOC)

Concerto: Mário Laginha

Table 5 – Networking Fridays statistics during 2020

	SESSIONS	33		TOTAL NUMBER OF USERS	4477
	REGISTRATIONS	5534		YOUTUBE VIEWS	4384
	UNIQUE VIEWS	3004		COUNTRIES AND OVERSEAS TERRITORIES	114
	TOTAL NUMBER OF PANEL MEMBERS	120			

5. FINANCIAL STATEMENTS 2020

5.1 ACCOUNTING REFERENCE FOR THE PREPARATION OF FINANCIAL STATEMENTS

The Financial Statements were prepared in accordance with the “*Sistema de Normalização Contabilística* (Portuguese GAAP)”, approved by Decree-Law No. 36-A/2011 of 9th March which, with the amendments introduced by Decree No. 98/2015 of 2nd June, which introduced the Directive 2013/34/EU of the European Parliament and the Council of 26th June 2013.

The Financial Statements were prepared, from the accounting records of the AD AIR Centre, in accordance with the NCRF - ESNL, on the assumption of continuity of operations.

5.2 MAIN ACCOUNTING POLICIES

The main accounting policies applied in the preparation of the AD AIR Centre financial statements are:

Tangible fixed assets are calculated at cost, decreased accumulated depreciation and any accumulated impaired losses.

Tangible fixed assets allocated free of charge where the cost is unknown are calculated at fair value, the value at which they are insured, or the value at which they were in the accounts.

Depreciations are calculated by the straight-line method.

The AD AIR Centre recognizes the subsidies when there is a reasonable guarantee that they will be received, and that the Association will comply with the conditions required for their grant.

The transfers/subsidies obtained from current expenses and depreciation and amortization of assets are deferred in the Balance Sheet, under the deferral item, being recorded as income for the period (item "Operating subsidies"), in proportion, respectively, to the corresponding expenses incurred and depreciation and amortization of assets during the life of the project, regardless of the time of receipt receiving.

The transfers/subsidies related to tangible and intangible fixed assets are initially recognized in Net Assets and are subsequently recognized in the P&L statement (Item "Imputation of subsidies and transfers for investments") on a systematic and rational basis during the accounting periods necessary to balance them with related expenses, e.g in proportion to their depreciation and amortization expenses over the useful life of the assets. In the event that the subsidy is related to non-depreciable assets, they are held in the net assets, unless the amount is necessary to compensate for any loss by parity.

Financial assets and liabilities are recognized in the balance sheet when the organization becomes part of the corresponding contractual provisions. A financial asset is any asset that is money or a contractual right to receive money. A financial liability is any liability that is subject to a contractual obligation to deliver money. Financial assets and liabilities are calculated at cost minus impairment losses:

- a) Instruments such as customers, suppliers, receivable accounts, payable accounts or bank loans, including those in foreign currency, and;
- b) Contracts to grant or borrow.

Financial instruments traded on a net and regulated market are calculated at fair value, recognizing the variations of this in return for results for the period.

The AD AIR Centre records its revenues and expenses in accordance with the principle of accrual, whereby revenue and expenses are recognized when obtained or incurred, regardless of receipt or payment, and is included in the financial statements of the periods to which they relate.

The Management used Value Judgments (except those involving estimates) in the process of implementing accounting policies that had the greatest impact on the amounts recognized in the financial statements.

The financial statements were prepared on the assumption of continuity of operations, based on the organization books and accounting records. The existing perspectives for the future and for the continuity of operations are based on past knowledge and events, the organization present framework in its sector, expectations of business evolution and the implementation of the strategy outlined for the near future. In a short/medium-term time horizon, no change is envisaged which could call into question the validity of

the current assumptions and therefore it is not expected that materially relevant adjustments will be made to the carrying amounts of the assets and liabilities in the next reporting period.

5.3 ANNEX TO ACCOUNTS

BALANCE SHEET			
(Amounts expressed in Euros)			
	Notas/Notes	31/12/2020	31/12/2019
ASSETS:			
Non-current assets:			
Tangible fixed assets	1	59 251,67	14 432,47
Other financial investments		6 364,22	2 398,83
		<u>65 615,89</u>	<u>16 831,30</u>
Current Assets:			
State and other public entities	2	-	6 147,20
Deferrals	3	2 151,26	2 396,04
Other current assets	4	8 877,14	-
Cash and bank deposits		687 823,17	236 702,07
		<u>698 851,57</u>	<u>245 245,31</u>
Total Assets		<u>764 467,46</u>	<u>262 076,61</u>
EQUITY FUNDS:			
Retained Earnings	5	3 207,69	9 149,69
Property fund adjustments	6	59 252,38	-
Net result for the period		5 716,82	50 023,52
Total Equity Funds		<u>68 176,89</u>	<u>59 173,21</u>
LIABILITIES			
Current Liabilities:			
Suppliers		22 899,76	61 955,25
State and other public entities	2	71 085,42	32 728,44
Deferrals	3	266 486,35	-
Other financial liabilities	4	335 819,04	108 219,71
		<u>696 290,57</u>	<u>202 903,40</u>
Total Liabilities		<u>696 290,57</u>	<u>202 903,40</u>
Total Equity Funds and Liabilities		<u>764 467,46</u>	<u>262 076,61</u>

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PROFIT AND LOSS STATEMENT

(Amounts expressed in Euros)

	Notas	31/12/2020	31/12/2019
Operating subsidies	7	1 526 324,64	1 062 750,00
External supplies and services	8	(494 242,99)	(481 518,82)
Staff costs	9	(1 025 906,76)	(520 926,59)
Other income	10	15 824,85	9 581,59
Other expenses	11	(1 377,25)	(12 047,05)
Earnings before interest, taxes, depreciation and amortization		20 622,49	57 839,13
Expenses/reversals of depreciation and amortization	1	(14 905,67)	(7 216,23)
Operating income (before financial expenses and taxes)		5 716,82	50 622,90
Interest and similar income obtained		-	-
Interest and similar expenses		-	-
Income before taxes		5 716,82	50 622,90
Income tax for the period		-	(599,38)
Net result for the period		5 716,82	50 023,52

STATEMENT OF CHANGES IN PATRIMONY FUNDS IN 2020

(Amounts expressed in Euros)

	Notes	Funding	Retained Earnings	Property fund adjustments	Net result for the period	Total Equity Funds
Position at the Beginning of the Period 2020	6	0,00	9 149,69	0,00	50 023,52	59 173,21
Period Changes						
First adoption of a new accounting referential						0,00
Changes in accounting policies			-7 215,52	59 252,38		52 036,86
Exchanges differences						0,00
Realization of revaluation surplus						0,00
Revaluation surplus						0,00
Adjustments for deferred taxes						0,00
Other Changes recognized in the equity funds			1 273,52		-50 023,52	-48 750,00
	7	0,00	-5 942,00	59 252,38	-50 023,52	3 286,86
Net Result for the Period	8				5 716,82	5 716,82
Integral Result	9 = 7 + 8				-44 306,70	-44 306,70
Position at the end of the 2020 period	6+7+8	0,00	3 207,69	59 252,38	5 716,82	68 176,89

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CASH FLOW STATEMENT

(Amounts expressed in Euros)

	31/12/2020	31/12/2019
<u>Cash Flows from Operating Activities:</u>		
Payment to Suppliers	-392 170,62	-581 564,81
Payment to Personnel	-730 450,53	-427 854,32
Cash generated from operations	-1 122 621,15	-1 009 419,13
Payment / receipt of income tax	-599,38	8 653,97
Other receipts / payments	-233 987,75	19 090,80
Flows from operating activities (1)	-1 357 208,28	-981 674,36
<u>Cash Flows from Investing Activities:</u>		
Payments in respect of:		
Tangible fixed assets	-46 278,37	-21 648,70
Financial Investments	-3 965,39	-2 398,83
Flows from investing activities (2)	-50 243,76	-24 047,53
<u>Cash Flows from Financing Activities:</u>		
Receipts from:		
Other financing operations	1 859 753,52	1 062 750,00
Payments in respect of		
Interest and similar expenses	-1 180,38	0,00
Cash Flow from financing activities (3)	1 858 573,14	1 062 750,00
Variation in cash and cash equivalents (1) + (2) + (3)	451 121,10	57 028,11
Effect of exchange differences		-11,27
Cash and cash equivalents at the beginning of the year	236 702,07	179 685,23
Cash and cash equivalents at the end of the year	687 823,17	236 702,07

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5.4 ANNEX TO FINANCIAL STATEMENTS

FINANCIAL STATEMENTS NOTES

(Amounts expressed in Euros)

NOTE 1 - Tangible Fixed Assets and Depreciation

Description	31/12/2020	31/12/2019
Tangible Fixed Assets		
Basic Equipment	35 874,42	-
Administrative Equipment	45 499,15	21 648,70
Accumulated Depreciation	(22 121,90)	(7 216,23)
Net Book Value	59 251,67	14 432,47
Depreciation for the Year	14 905,67	7 216,23

NOTE 2 - State and Other Public Entities

Description	31/12/2020	31/12/2019
Other Current Assets		
State and Other Public Entities		
Recoverable VAT	-	6 147,20
Total	-	6 147,20
Other Current Liabilities		
State and Other Public Entities		
IRS Payable	30 339,56	13 278,50
IRC Payable	-	599,38
VAT Payable	6 914,67	
Social Security Contributions	33 831,19	18 403,10
FCT e FGCT	-	447,46
Total	71 085,42	32 728,44

NOTE 3 - Deferrals

Description	31/12/2020	31/12/2019
Assets		
Occupational Medicine	963,00	-
Insurances	-	2 396,04
IT Services	1 188,26	-
Total	2 151,26	2 396,04
Liabilities		
Income to be Recognized	266 486,35	-
Total	266 486,35	-

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NOTE 4 - Other Current Assets and Liabilities

Description	31/12/2020	31/12/2019
Other Current Assets and Liabilities		
Advance Payment Suppliers	8 877,14	-
Total	8 877,14	-
Other Current Liabilities		
Remunerations to be Liquidated	143 988,18	95 495,27
Other Expense Accruals	190 365,57	1 654,69
Others Creditors	1 465,29	11 069,75
Total	335 819,04	108 219,71

Note 5 - Transited Results

The carried forward income item comprises the accumulated net results of previous periods, including the application of the income from the past year, in the amount of EUR 50,023.52.

Additionally, the variation of this item also includes regularizations related to subsidies that did not affect the results of the period.

Note 6 - Adjustments in Property Funds

This item includes asset-related subsidies, which are transferred on a systematic basis to the other income item (imputation of investment subsidies), to the extent that depreciation/amortization of the investment to which they relate is accounted for.

NOTE 7 - Operating Subsidies

Description	31/12/2020	31/12/2019
FCT - geral	1 010 363,62	700 000,00
ESALAB - geral	378 925,73	300 000,00
CE2COAST	3 691,00	-
MBON	81 500,75	-
RAEGE 2020	11 942,36	48 750,00
ASTRAL	16 172,25	-
ATLANTIC	2 608,63	-
HYPERS	2 637,36	-
FPACUP	1 434,13	-
ARI-ESA POSTS A3	1 542,07	-
ARI-ESA ENERGY A2	2 272,41	-
PORT XXI ESA	6 524,93	-
MAGAL	125,09	-
E5DES	6 584,33	-
OUTROS/ Others	-	14 000,00
Total	1 526 324,66	1 062 750,00

NOTE 8 - External Supplies and Services

Description	31/12/2020	31/12/2019
Consulting Services	110 258,27	135 959,10
Admin. and Financ. Support, Advice, Auditing, Legal	232 941,12	54 663,50
Publicity and Advertising	906,53	7 460,40
Fees	507,53	44 370,47
Office materials	11 088,43	10 671,30
Travel costs	41 626,82	181 056,99
Communication	8 353,18	7 179,87
Conferences and Seminars Events Communication and Design	69 728,94	14 045,69
Rents and Rentals	13 393,35	1 626,00
Other Supplies and Services	5 438,82	24 485,50
Total	494 242,99	481 518,82

NOTE 9 - Staff Costs

Description	31/12/2020	31/12/2019
Staff Costs and OS	796 202,36	394 632,47
Extraordinary Award	60 000,00	35 233,53
Social Security	149 409,92	85 178,80
Workplace Accident Insurance	9 070,55	3 380,09
Other Staff Cost	11 223,93	2 501,70
Total	1 025 906,76	520 926,59

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NOTE 10 - Other Income

Description	31/12/2020	31/12/2019
Corrections to Previous Years	-	9 435,16
Exchange Difference	296,06	146,43
Allocation of Investment Grants	14 905,67	-
Other Income	623,12	-
Total	15 824,85	9 581,59

NOTE 11 - Other Expenses and Losses

Description	31/12/2020	31/12/2019
Stamp Tax	-	12,93
Prior Year Adjustments	-	3 819,90
Exchange Difference	654,30	-
Documents with no Legal Requirement	-	8 054,91
Other Expenses and Losses	722,95	159,31
Total	1 377,25	12 047,05

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Executive Committee

5.5 INFORMATION BY LEGAL DECREE

Pursuant to article 21 nº1 of Decree-Law No. 411/91 of October 17th, the AD AIR Centre Association confirms that it is not liable for any overdue contributions to Social Security and is not be liable for any amount due before the Tax Authority.

The Net Income calculated in 2020, in the amount of 5,716.82 euros, will be transferred to the item of carried forward results.

The Official Auditor of Accounts is the Company Martins Pereira, João Careca e Associados, SRC, Lda. and, during the year 2020, earned 4,950 euros, plus VAT, as fees.

6. ANNEXES

ANNEXES	DESCRIPTION
1	Members of the General Assembly 2020
2	Members of the Board of Directors 2020
3	Composition of Human Resources 2020
4	Future prospects and subsequent events 2021
5	Audit Report

ANNEX 1

Table 6 - Members of the General Assembly 2020

PRESIDENT (FCT REPRESENTATIVE)	Paulo Ferrão
SECRETARY REPRESENTATIVE OF THE REGIONAL GOVERNMENT OF THE AZORES	Francisco L. Wallenstein F.M Macedo
FCT REPRESENTATIVE	Ana Quartin
REPRESENTATIVE OF THE REGIONAL GOVERNMENT OF THE AZORES	Luís Ramalhais Santos
PLOCAN REPRESENTATIVE	Joaquín Brito
PLOCAN REPRESENTATIVE	Paula Pacheco Santamarina
UNITED KINGDOM REPRESENTATIVE <i>(Research Infrastructures Policy Lead, Fusion Research Infrastructures and Establishments Team)</i>	Oliver Payne
UNITED KINGDOM REPRESENTATIVE <i>(Senior Policy Advisor at Department for Business, Energy and Industrial Strategy)</i>	James Loveder
REPRESENTATION OF NIGERIA (PARTICIPATION AS AN OBSERVER AT GENERAL ASSEMBLY NO. 6) <i>(Director Nigerian Space Research and Development Agency)</i>	Asma Ibrahim

ANNEX 2

Table 7 - Members of the Board of Directors 2020

PRESIDENT (PORTUGAL)	Bruno Pacheco
CEO (SPAIN)	Miguel Belló Mora
MEMBER (PORTUGAL)	Carolina Rêgo Costa
MEMBER (SOUTH AFRICA)	Cecil Masoka
MEMBER (NIGERIA)	Mosto Onhua
MEMBER (UNITED KINGDOM)	Nick Veck
MEMBER (BRAZIL)	Maurício Guedes
OFFICIAL AUDITOR (Portugal)	João Careca (Martins Pereira, João Careca & Associados, SROC, Lda)

ANNEX 3

Miguel Belló Mora



Chief Executive Officer (CEO)

Mariana Ávila



Project Developer, EO Lab

Stewart Bernard



Chief Science Officer (CSO)
Under a CSIR agreement

Emanuel Castanho



Junior Project Engineer Intern

Tânia Li Chen



Project Officer

Catarina Paes Duarte



Events and Network Manager

Alexandra Frazão



Executive Secretary

Márcia Gonçalves



Senior Project Officer, EO Lab

João Bentes de Jesus



Project and Business Developer



Rui Martins



Senior Project Officer, EO Lab

Inês Correia Mesquita



Administrative and Scientific
Communication Assistant

Mariana Moreira



Scientific and Project Officer in
Geodesy, Geophysics and Earth
Observations

José Luís Moutinho



Chief Network Officer (CNO)

João Pinelo



Data Scientist and Senior Project
Officer

Geisa Rosa



Administrative and Financial
Officer

Pedro Silva



Chief Technology Officer (CTO),
EO Lab

Emir Sirage



Chief Operations Officer (COO)

Joana Soares



Executive Secretary for MBON
and Project Officer for AIR Centre

Alice Soccodato



Scientific Programmer for MBON and AIR
Centre

ANNEX 4

Future prospects and subsequent events 2021

At the present time, 1st semester of 2021, the AIR Centre considers that the impact of national COVID-19 pandemic-related measures should be reduced to moderate, therefore not jeopardizing the continuity of AIR Centre operations, supported by the following commitments:

1. According to The Council of Ministers Resolution (RCM) No. 29/2018, during the year 2021, the Foundation for Science and Technology (FCT), is committed to transfer an amount equivalent to 1,040M€;
2. In accordance with The Council of Ministers Resolution (RCM) No. 55/2019, during the year 2021 and under the ESA@Lab business plan, the Foundation for Science and Technology (FCT), is committed to transferring an amount equivalent to 500K€;
3. The Regional Government of the Azores (RGA), through the Regional Secretariat of Culture, Science and Digital Transition, and represented at the Board of Directors of the AIR Centre, is committed to the programs, initiatives/events, projects in the context of the autonomous region of the Azores and the international network of the AIR Centre;

ANNEX 5

Audit Report



AIR CENTRE

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