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AIR CENTRE

ATLANTIC INTERNATIONAL RESEARCH CENTRE

MANAGEMENT AND FINANCIAL REPORT 2021



This final version of the AIR Centre management report and financial statements regarding 2021 reflects what was approved by the Board of Directors.

INDEX

1. Message from the CEO	6
2. Introduction	12
3. Global Challenges and Operational Objectives	14
3.1 Global Challenges	14
Clean and Productive Bays and Estuaries	17
Resilience to Coastal Natural Hazards	18
Sustainable Food Production	21
Improved Management of Marine and Coastal Resources	22
Improved Environmental and Maritime Monitoring	25
3.2 Operational Objectives	26
3.3 Outcomes of the 2021 Operational Objectives	32
3.3.1 Acquisition of High and Very High Resolution Earth Observation Satellites: Geosat-1 and Geosat-2	38
3.3.2 Implementation of a Direct Receiving Station (DRS) for Satellite Data and AIR Data Center inception/design	40
3.3.3 Workshop with AIR Centre Network Members for the Identification of the Main Technical Requirements for the design of the "Atlantic Constellation"	50
3.3.4 Implementation of the Strategic Programme Oriented towards the Atlantic within the Portuguese Chairmanship of the Eureka Network in the Period 2021-22	58
3.3.5 Continuation of the Activities of the AIR Centre Scholarship Program	69

4. Earth Observation Laboratory (EO Lab) Growth	71
4.1 Secretariat of the Marine Biodiversity Observation Network MBON	74
4.2 A-RAEGE-Azores	79
5. Expansion of the distributed network in the Atlantic	82
6. Projects Approved in 2021	84
6.1 Development of projects in the Atlantic	84
7. Promotion of actions with national and international impact	86
7.1 Networking Fridays	88
8. Other initiatives – Special Committee on Ocean Research (SCOR), United Nations Environment Programme (UNEP), United Nations Office for Outer Space Affairs (UNOOSA)	94
9. Financial Statements 2021	96
9.1 Accounting Reference for the Preparation of Financial Statements	96
9.2 Main Accounting Policies	96
9.3 Annex to Accounts	99
9.4 Information Required by Legal Diplomas	106
ANNEXES	107



1. MESSAGE FROM THE CEO



Despite having been the second year of the devastating pandemic that is ravaging the planet, 2021 has been an exceptional year for the Atlantic International Research Centre (AIR Centre), where all operational objectives have been achieved and the organizational structure has been consolidated.

Regarding the internal organization, working procedures have been extended to areas such as Human Resources (HR) and Document management and the ERP “Enterprise Resources and Planning” platform to support the financial and accounting issues (i.e Primavera), continuously implemented during 2021, as to support for project control and management. Regarding the number of HR, the AIR Centre team has reached the headcount up to 19 employees and three (3) interns (plus two (2) HRs from Colab +Atlantic, under a collaboration protocol) in Terceira island - Azores and Lisbon.



During 2021 the AIR Centre international Network has been also extended. This to mention that countries already linked to the network requested during 2021 the formal membership: South Africa and Angola. On the other hand, two additional countries were also approved to join the organization during the year: Morocco and Colombia. This allowed the continuous increase of the existing network in both sides of the Atlantic Ocean.

With respect to competitive projects, the AIR Centre has been very active during 2021 in the presentation of proposals with different stakeholders of the network: companies, universities, research centres and governmental organizations. Several new projects were awarded to the AIR Centre as prime or as partner with international consortia teams. Between those new awarded projects we can highlight: i) LABPLAS, a project for the large scale monitoring and mapping of plastics in the ocean; ii) NextOcean, a project to deliver operational services in the field of blue economy; iii) AEROS, a project to develop a new microsatellite for ocean monitoring; iv) K2D, a project to use submarine cables to get observational data of oceans; v) ATON and vi) Space4Atlantic, two projects with the European Space Agency (ESA) to start the definition of the Atlantic Constellation of microsatellites and vii) SAP a project to assist the milk producers in the Azores islands by mitigating the problem of a cow disease, related to a fungus, that affects the cattle.

In parallel to the elaboration of proposals and the execution of projects, in a similar way as during 2020, an intense activity in the organization of international events was performed by the AIR Centre during 2021 despite the difficult situation with the pandemic.



The AIR Centre was a co-organizer of the All-Atlantic Research Alliance Conference in São Miguel - Azores, 3rd and 4th of June, with all actors along the Atlantic. The AIR Centre was also one of the co-organizers of two important events within the Portuguese Presidency of the European Union: the Climate-Space Interactions Conference in Lisbon, 21st of April and the European-African Summit on Earth Observation, also in Lisbon, 10th and 11th June, where the main stakeholders from Europe and Africa (European Union, African Union, European Space Agency, African Space Agency, Eumetsat, ...) met to discuss collaboration opportunities in the Space sector, namely how Earth Observation is transformative for downstream applications. Further, to keep connected the AIR Centre international network, the series of "Networking Fridays" webinars were continued, and presently one of the most important events of the Ocean community all around the world with the participation of outstanding leaders in the domains of Ocean, Space or Climate sciences and other stakeholders from more than 125 countries in the world.

Regarding the financial issues, the result of the year was positive close to 40K€ and the Balance Sheet is very solid with most of the active assets in cash. In a similar way to 2020, a positive cash flow of 159 K€ was observed during 2021, consolidating the treasury.



Regarding the AIR Centre flagship projects, the acquisition of the Geosat-1 and Geosat-2 High and Very High-Resolution Earth Observation satellites was done by the new company (the first Portuguese satellite operator) Geosat, where AIR Centre holds 10% of the shares. Those two satellites can provide valuable data to all AIR Centre network members in cases of emergency or for scientific purposes. With respect to the implementation and deployment of the Direct Receiving Station (DRS), the work progressed during 2021, the antenna has been received at Terinov Science Park premises in Terceira Island and the final installation shall be done in the 1st semester of 2022. The AIR Data Centre Architecture has been also designed and implementation shall follow the final installation of the DRS antenna.

Regarding the Atlantic Constellation of small satellites, an important workshop of users was organized in hybrid format at the AIR Centre headquarters in Terceira Island during July 2021, where hundreds of users from many countries (South Africa, Angola, Nigeria, Cape-Verde, Brazil, Mexico, Spain, United Kingdom, Norway, Portugal,...) participated to define the “Atlantic Constellation” users requirements.



During 2021, the AIR Centre took-over the Presidency of Eureka under the Portuguese Chairmanship for the period 2021-2022. Eureka is the largest international network of innovation funding bodies with over 48 countries. Eureka projects are oriented towards close to the market bottom-up innovation in international collaboration, with a variety of different programs.

AIR Centre assumed the Presidency and defined aligned the strategic objectives: the study of Ocean-Space interactions and the use of Earth Observation from space for the benefit of the citizens. In addition, AIR Centre has started a program called “Eureka meets the Atlantic”, where several events were planned in Lisbon, Cape Town, Rio de Janeiro, Boston and Oslo, in order to increase the collaboration of Eureka countries companies and research organizations with those of the countries of the Atlantic, especially along Africa, South and North America. The first of those events was organized in Lisbon in June 2021, at the same week of the national science event – Science 2021. Due to the pandemic, the expected meetings for Boston and Cape Town were moved to 2022.

Finally, in parallel to all above activities, the AIR Centre Scholarship Program "Training the leaders of the Future" was continued during 2021, with the award of several PhD scholarships for international collaboration.



2. INTRODUCTION

The Atlantic International Research Centre (AIR Centre) is an international organization. It is distributed in a network in Atlantic bordering countries, and it is oriented towards promoting the creation of new jobs and sustainable economic development based on the knowledge of the Atlantic regions.

It tackles and integrates the scientific areas of space, atmosphere, ocean, climate, energy, and data science while promoting North-South / South-North / North-North / South-South cooperation, in alignment with national and regional priorities, and with global challenges, such as the United Nations 2030 Agenda for Sustainable Development, the Decade of Ocean Science for Sustainable Development (2021-2030), the Paris Agreement, and the Sendai Structure for Risk Reduction (2015-2030).

The AIR Centre envisions the advancement of science and technology on a transformative scale in the Atlantic regions, and to do so its structure is internationally distributed in a network. This network is comprised by several nodes which act in accord to develop initiatives, projects, and integrated actions in the Atlantic space, taking advantage from and fostering synergies between existing researchers, infrastructure, institutions and resources, distributed throughout the Atlantic region, being the primary and essential form of this intersection.

Portugal is the host of the AIR Centre, having established, in accordance with the Florianópolis Declaration, 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 objectives of the AIR Centre.

1. The Florianópolis 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 in Ilha Terceira, in the Azores, 2017, and which served to discuss forms of international cooperation with a view to promoting the use of highly skilled human resources and the development of Atlantic regions.

The schedule for the implementation of the AIR Centre (see figure 1) has given rise to several high-level meetings between Government-Academy-Industry, involving participants at the ministerial level from various Atlantic bordering countries. In addition to the formally associated countries of the AD AIR Centre – i.e., Portugal, Spain, the United Kingdom, Nigeria, Cape Verde, South Africa, Angola, Morocco, Colombia, Brazil (State of Bahia), the US, Sao Tome and Principe, Namibia, Ghana, as well as Norway, Mexico. The network continues to expand, and there have been several expressions of interest, as well as collaboration and integration by other Atlantic nations. Therefore, we have included the network map reflecting the ongoing expansion of the AIR Centre in the Atlantic (North/South - South/North, see figure 2)

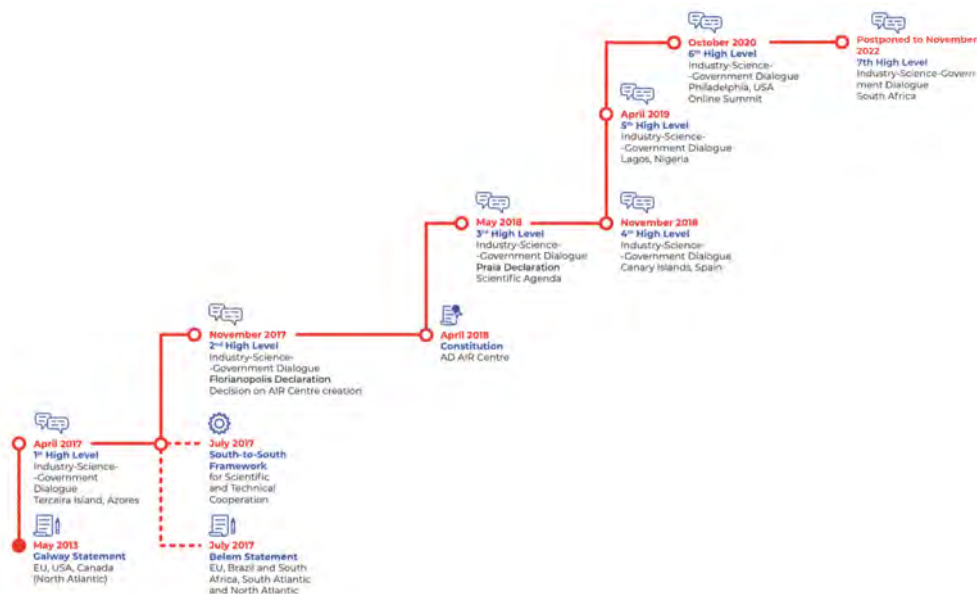


Fig. 1 - Schedule for the Implementation of the AIR Centre 2017-2021



Fig. 2 - Map of the AIR Centre Network

3. GLOBAL CHALLENGES AND OPERATIONAL OBJECTIVES

3.1 GLOBAL CHALLENGES

The AIR Centre is a networked organization, which worked collaboratively and is distributed internationally. It is oriented to promote and create value and benefits for science, the economy and citizens of the Atlantic area aligning with regional, national, international priorities and based on three major global challenges:

- Climate change,
- Digital transformation, and
- population dynamics related to income inequalities.



Clean and Productive
Bays and Estuaries



Resilience to Coastal
Natural Hazards



Sustainable Food
Production

Fig. 3 – Five (5) missions of the AIR Centre



To achieve these global objectives during 2021, the AIR Centre aimed primarily at strengthening 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.

For 2021, the AIR Centre continued the development of its activities based on a scientific agenda aligned with five (5) missions aimed 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 projects to continue 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 3:



Improved Management of
Marine and Coastal Re-
sources



Improved Environmental
and Maritime Monitoring

For a broad understanding of the five (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 which are 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 integrated ecosystem management of bays and estuarine areas and promote benchmarking and research & action for the preservation, restoration and sustainable development of several key Sites in 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 life and reduce the material and economic impacts of these devastating events.







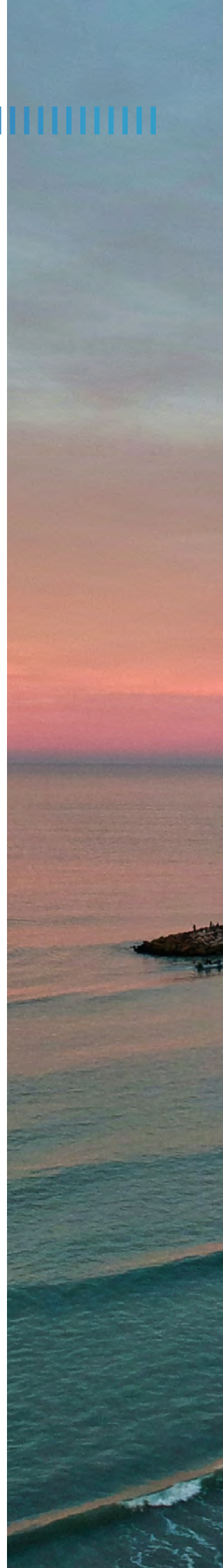
SUSTAINABLE FOOD PRODUCTION

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 of supporting 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 provision 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, i.e., satellite data, in-situ observations, assimilative modelling, and artificial intelligence. The AIR Centre will also stimulate the implementation of satellite constellations, marine robotics, oceanographic ships and autonomous systems for open access data collection, storage and sharing.



3.2 OPERATIONAL OBJECTIVES

During 2021, the AIR Centre defined several operational objectives for the pursuit of its global challenges, which will continue to be implemented and consolidated during 2022. The focus and its determination are oriented towards strengthening the organization as a distributed network, with added value and international reference for Atlantic Interactions in the large Atlantic Area. However, during 2021, the global community had to continue to adapt and maintain operational agility to overcome the worst pandemic of the 21st century, designated as COVID-19. The AIR Centre maintained its operations with dynamism and proactivity and was adjusted according to government decrees for the control of the pandemic, both in the Continent and in the Azores. The measures which were undertaken for this adjustment were the following:



Maintaining the health of the AIR Centre team and stakeholders was considered a priority,

Instructions, recommendations, procedures, and contingency plans were defined, aligned with the policies of the pandemic management of the Science and Technology Park of the Terceira Island - TERINOV and the General Secretariat 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 office in Lisbon) and remote work,

Continuity of operations, i.e., 100% operational with all human resources available, having been maintained through the use of video and teleconference tools (e.g., zoom, MS teams, GoTo Meeting, etc...) for the continuity of activities at the internal level and interaction with external stakeholders,

Re-allocation of priorities and objectives,

Replanning the 2021 events to the mode: 100% online or hybrid always adjusting to the pandemic management measures and policies that were in place.



The operational objectives set in 2021 were as follows:

- **Further consolidation of the internal structure:** continuity in the integration of new human resources (HRs), based on an organization chart that had to be slightly updated by the CEO (see figure 4) to correspond to the operational dynamics of the organization, availability and access to facilities (both in the Azores and in the offices in Lisbon), continuing the implementation of internal procedures to support management and administration, based on the consolidation of the following documents/processes:

1. Handbook, workflow for the management of HRs and Training Plan,
2. Project management and monitoring (i.e., digital in the AIR Centre's GDrive and its physical support through archive folders),
3. Document management (i.e., instructions for document identification),
4. AIR Centre Safety Manual under the General Data Protection Regulation (GDPR),
5. Gender Equality Plan,
6. Planned and structured organization of meetings of the General Meeting, the Board of Directors and the Executive Committee.

Organization chart in 2021, with update proposed by the CEO



Fig. 4 – AIR Centre Organization Chart 2021



- Implementation of key initiatives:

- a. Acquisition of High and Very High-Resolution Earth Observation satellites: Geosat-1 and Geosat-2 for the development of new applications and services within the AIR Centre missions;
- b. Implementation of a Direct Receiving Station (DRS) for satellite data and design of the AIR Data Center on Terceira Island;
- c. Workshop with AIR Centre network members to identify the main technical requirements for the design of the "Atlantic Constellation";
- d. Implementation of the Strategic Programme oriented towards the Atlantic under the Portuguese Presidency of the Eureka international network in the period 2021-2022;
- e. Continuation of the activities of the AIR Centre Scholarship Programme.

- Growth of the Earth Observation Laboratory (EO Lab):

In addition to the management and implementation of the R&D projects of the AIR Centre, DRS and AIR Data Center, effective continuity in the consolidation of EO-Lab activities, with regards to – ESA_Lab Azores, SECRETARIAT MBON, A-RAEGE-Azores,



- Extension of the AIR Centre network in the Atlantic:

consolidation of the current network, creation of new partnerships and agreements with Atlantic countries, and continued development of international cooperation with different stakeholders,

- Development of Atlantic-oriented projects:

continuous implementation of ongoing projects, including those initiated in 2020 and 2021, and the design and preparation of new project proposals with the AIR Centre network with implementation in 2022;

- Promotion of actions and events with regional, national, and international impact:

dissemination, stimulation of social and economic impact, through the organization of events and other initiatives that promote active networking in the network and that expand the institutional visibility of the AIR Centre as a unique actor of Atlantic interactions.



3.3 OUTCOMES OF THE 2021 OPERATIONAL OBJECTIVES

FURTHER CONSOLIDATION OF THE INTERNAL STRUCTURE

During 2021, internal procedures were consolidated to ensure compliance with national legislation on public procurement, finance, and human resources. The progressive implementation of electronic administration means, the use and integration of management and administration systems, favoring the improvement of the efficiency and quality of internal and external service, as well as knowledge management, has begun.

The following results should be highlighted in this context:

- Digital operationalization of financial administration through the use of platform/software for financial management and accounting designated: Primavera,
- Consolidation of the planned implementation between 2020 and 2021 of the procedures:
 - human resources management, training plan and 1st session(s) with HRs in Lisbon and Azores for the performance evaluation of the previous year,
 - treasury management and management control,
 - project management (from opening, monitoring and closure at the administrative, financial and operational level incorporating electronic and physical support through archive folders),
 - completion of the manual of the General Data Protection Regulation - GDPR,
 - drawing/writing of the gender equality plan.



Considering that 2021 continued to pose an external factor of impact on operations due to the continuation of the COVID-19 pandemic crisis, the AIR Centre maintained a progressive dynamic in the hiring of new human resources. In January 2021, a total of seventeen (17) employees were part of the AIR Centre, and by December 2021 the total number of employees in the organization's staff amounted to nineteen (19) (see figure 5).

Note should also be given of the integration of employees with a special regime, i.e. two (2) external employees through a protocol with the partner institution CoLab +Atlântico, with technical and strategic contribution to the flagship initiatives of the AIR Centre, namely the "Constellation of the Atlantic" and three (3) employees integrated by the Estagiar – L programmes, Internship – T promoted by the Regional Government of the Azores, and professional internship in Lisbon designated for young graduates /masters.

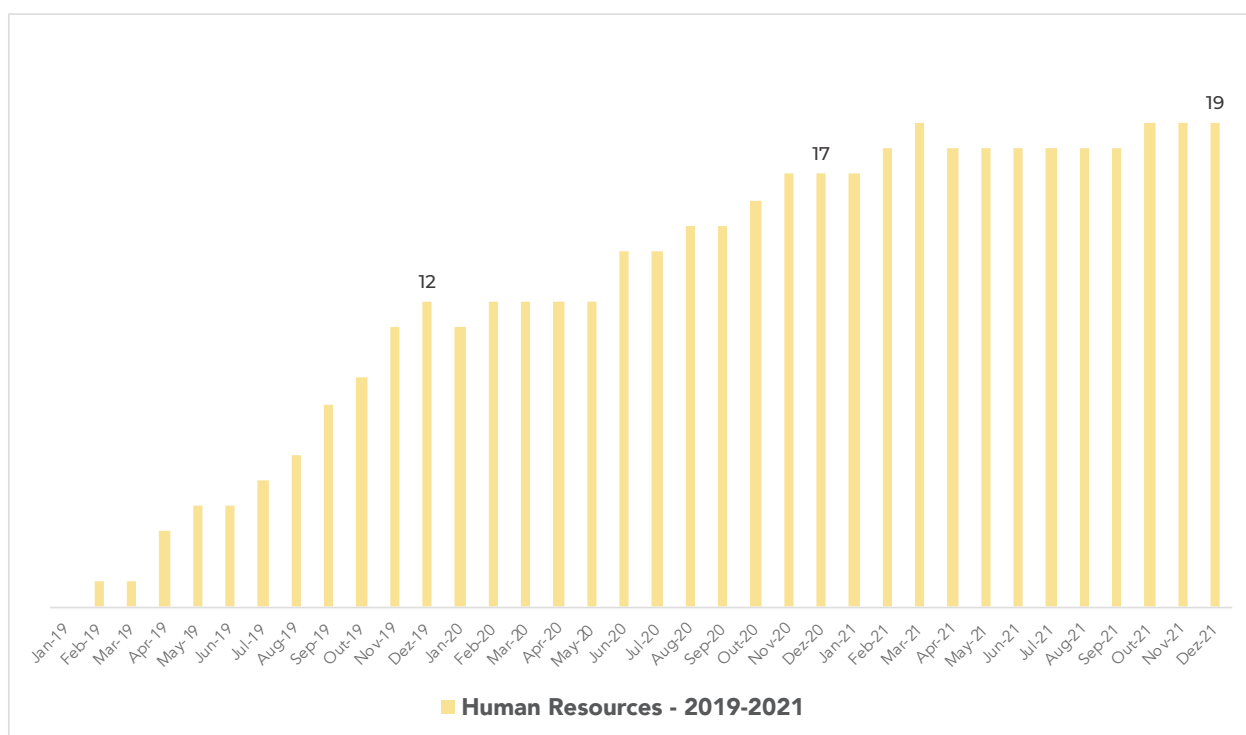


Fig. 5 – Evolução dos RHs no AIR Centre (2019-2021)



With regard to human resources qualifications in 2021, the distribution is as follows: seven (7) Doctorates, eight (8) Masters, three (3) Graduates and one (1) with training not higher than the total employees of the AIR Centre (see figure 6).

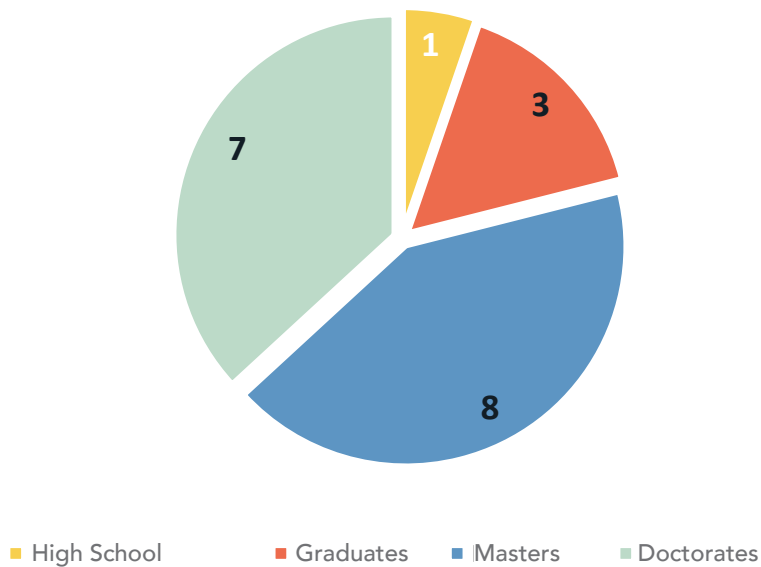


Fig. 6 – Distribution of AIR Centre HRs qualifications in 2021

With regards to gender indicators in 2021, eleven (11) is the total number of female employees of the AIR Centre (see figure 7).



Figura 7 – Gender indicators at AD AIR Centre in 2021



Concerning the planned and structured organization of the formal meetings of the main bodies of the AIR Centre in 2021, the General Assembly (AG) met three times during 2021 (see also Annex 1, members of the AG), having agreed on the following key topics for discussion and approval:

Table 1 – General Assembly Meetings 2021

DATE	GENERAL ASSEMBLY	KEY TOPICS FOR DISCUSSION AND APPROVAL
APRIL 9TH	#10	• Presentation, discussion and approval of the Financial Report, Accounts and Balance Sheet 2020, • Presentation of the 2021 activity plan, • Budget 2021, • Election of the President and Secretary of the General Assembly, • Election of the Board of Directors for the period: 2021-2024, • Renewal of the Statutory Auditor (ROC) for the period: 2021-2024, and • Application to AD AIR Centre by the State of Bahia, Brazil;
OCTOBER 22ND	Extraordinary #11	• Overview of 2021 activities, • Request for adhesion to the AIR Centre General Assembly by three countries: South Africa, Morocco and Angola, and • Status update of the application of Colombia, the Dominican Republic and Peru.
10 DE DEZEMBRO	Nº12	• Request for adhesion to the AIR Centre General Assembly by: Colombia, • Overview of 2021 activities, • Proposal - 2022 activity plan, • Forecast of the closing of accounts 2021, and • Proposal - Budget for 2022.



The Board of Directors (CA) of the AIR Centre (see also Annex 2, members of the CA) met regularly in 2021: on March 26th, October 1st, November 25th – always in conjunction with the issues discussed in the Executive Committee (emanation of the CA, of an operational nature of the management), and whenever necessary. The members who currently make up the governing bodies of the AD AIR Centre, with the exception of the CEO and the Official Statutory Auditor, do not receive any kind of remuneration, by decision of the General Meeting.

The CEO, the management team, the human resources of technical/ operational and administrative profile ensure the execution of all activities and tasks foreseen for the efficient functioning of the AIR Centre, in order to continuously improve the effectiveness of procedures. These include 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 with 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 digitization, and monitoring the work of auditors in the financial area and ongoing projects, based on compliance with applicable legislation.

IMPLEMENTATION OF KEY INITIATIVES

3.3.1 ACQUISITION OF HIGH AND VERY HIGH RESOLUTION EARTH OBSERVATION SATELLITES: GEOSAT-1 AND GEOSAT-2

With regard to the implementation of the key initiatives of the AIR Centre during 2021, the acquisition of the Geosat-1 and Geosat-2 (“High and Very High-Resolution – VHR”) satellites continued with the plan, and the acquisition operation was completed by the first Portuguese satellite operator, Geosat (<https://geosat.space>), in conjunction/support from Spain, Mexico and Norway, and in which the AIR Centre currently holds 10% of shares.

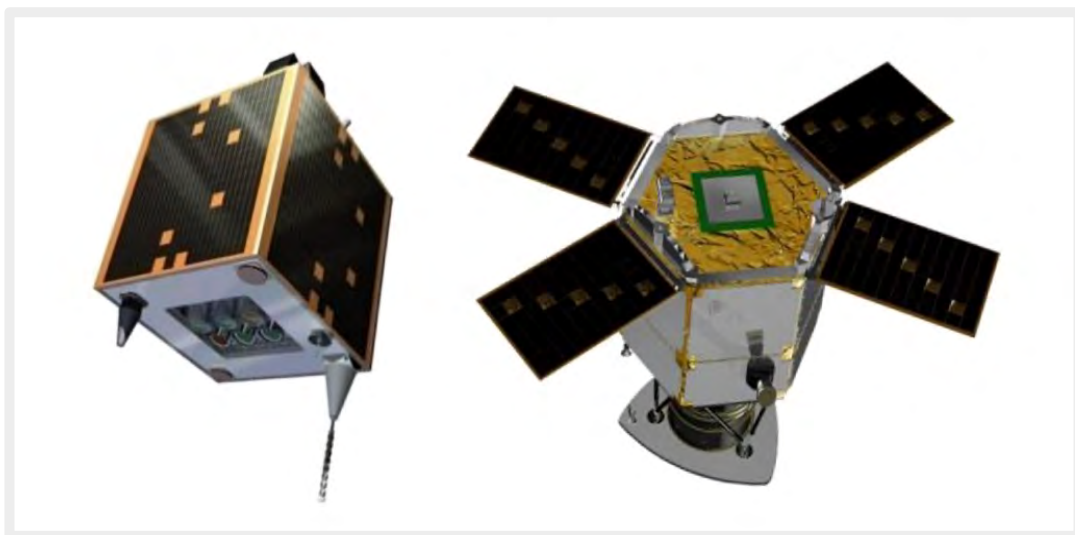


Fig. 8 – Earth Observation Satellites: Geosat 1 (left) and Geosat 2 (right)

These two satellites will provide key Earth Observation (EO) data that will be made available to all AIR Centre network members for emergency situations or for scientific purposes, such as the images/examples that follow:



Fig. 9 –
Eruption and lava
path of La Palma
volcano in the
Canary Islands,
Spain

Fig. 10 -
Extent of the
Castro Marim
Fire, Portugal



Figura 11 –
Impact of floods
in North Rhine-
Westphalia,
Germany



It should be noted that studies by the most prestigious international consultants indicate that the Market of Earth Observation, and in particular in the “downstream” that is oriented to the development of applications based on Artificial Intelligence, Big Data, “Machine Learning” and other methodologies for the provision of effective services in the areas of oceanography, fisheries, agriculture, environment, natural disasters, renewable energies, smart cities and the future, etc. there will be a multiplier factor that can reach the value of 10, generating highly qualified jobs that can be created by the end of the decade in 2030, in the areas of digital transformation, Artificial Intelligence, Big Data, validating how the AIR Centre has been consolidating its strategic positioning in the area of national and international Space.

3.3.2 IMPLEMENTATION OF A DIRECT RECEIVING STATION (DRS) FOR SATELLITE DATA AND AIR DATA CENTER INCEPTION/DESIGN

Following the award and purchase of the Direct Receiving Station (DRS) of satellite data (which includes a satellite antenna as well as data processing equipment, see figure 12), the AIR Centre will, through that station, receive and process about 290 GBytes daily. It is therefore necessary to acquire servers to create a system for the storage of such data that allows its subsequent access in an expeditious manner, with sufficient capacity to store and access data for a minimum period of 6 months, and ideally for several years.



Photo by Diego PH on Unsplash

The acquisition of DRS processing and storage systems implies a minimum server volume of 2-3 racks, depending on the exact technical solution and the period for which the data is saved. This type of complex equipment needs to be placed in a dedicated room with access control, temperature and humidity, and sound. Therefore, it was necessary to place this equipment in a data center. At the same time, it was also necessary to create a support for the DRS antenna that ensures good exposure to the horizon to maximize the daily period of contact with satellites, and at the same time that is not more than 70 metres (ideally less than 30 metres) away from the data reception servers.

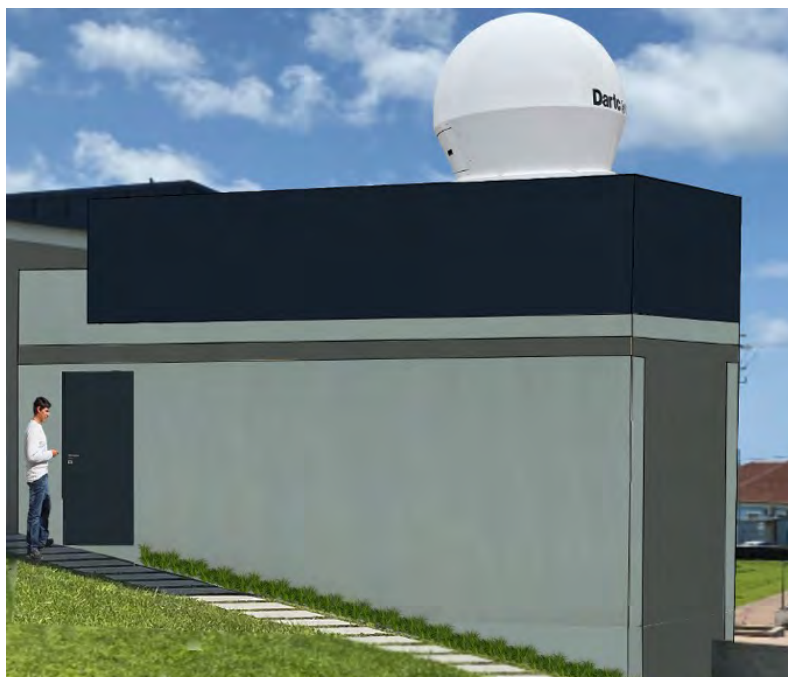
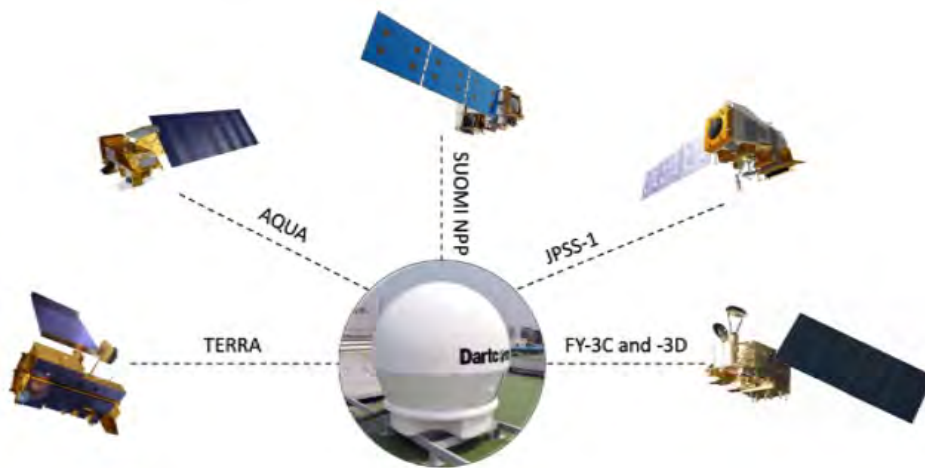


Fig. 12 – Direct Receiving Station (DRS), reception of five (5) satellites and model of the building under construction



The AIR Centre, in its strategy for the development of activities around data science, started in 2021 with the design and implementation of an infrastructure that is called AIR data center. With the administration of TERINOV, we chose the place in the vicinity of this Science and Technology Park of Terceira Island, where it would be possible to build a small building that would simultaneously guarantee the minimum capacity of racks and a good positioning of the DRS antenna.

The engineering project was contracted for the Data Center and a competition was launched for its execution. The work began on September 10, 2021, with preparation of the site with a shipyard and start of removal of land as can be seen in figure 13.



Fig. 13 – Early days of the work for the installation of the building for DRS and AIR Data Center





The AIR Data Center project included several technical specialties, namely: special air conditioning (temperature and dehumidification), and automatic detection and extinguishing of fires and other areas of this type of installation.

The simplified sequence of work includes:

1. Construction,
2. Installation of the antenna holder on the roof of the building,
3. Electrical installation,
4. Pre-installation of the air conditioning,
5. Installation of interior lining of walls,
6. Installation of technical floor,
7. Backstage installation,
8. Containerization installation,
9. Installation of the network and connection to the outside,
10. Installation of the air conditioning,
11. UPS installation,
12. Installation of automatic fire-extinguishing and system,
13. Installation of DRS with reception servers and data processing,
14. Installation of storage servers, and
15. Installation of data analysis servers.



Fig.14 – Evolution of the work in mid-December 2021

At the end of 2021, construction was underway, as can be seen in figure 14. Taking place at the same time as the construction work, and given the difficulties with supply chains, especially with regard to the electronics and microprocessor market, previous research on data storage solutions had to be updated, specifications were drafted, and the technically possible capacity of a solution that is expandable and modular was acquired, in terms of system architecture, as described in figure 15.

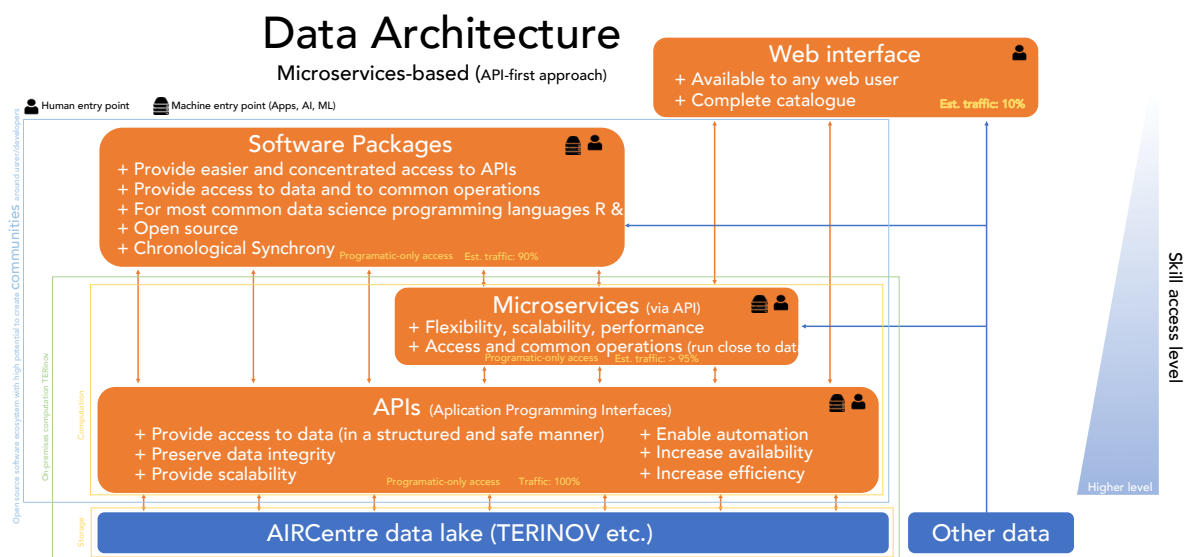


Fig. 15 – Design and architecture of the system for data management in the AIR Data Center

It should be noted that the capacities installed in the AIR Data Center allow an advanced connection to the International scientific community. This stems from an agreement between the Foundation for Science and Technology (FCT) and the AIR Centre in which a rapid connection line was installed as an extension of the public scientific communication network, RCTS, allowing the availability of acquired and processed data to research entities and companies with high transmission speed between the Islands and the Mainland.



Also at the end of 2021, the reception of the DRS antenna was celebrated at Terinov's facilities, with the presence of the President of the Regional Government of the Azores and the Minister of Science, Technology and Higher Education. AIR Data Center and DRS are expected to be operational during the first half of 2022, including in this report a real image of March 2022 (see figure 16) of the building previously illustrated under construction.

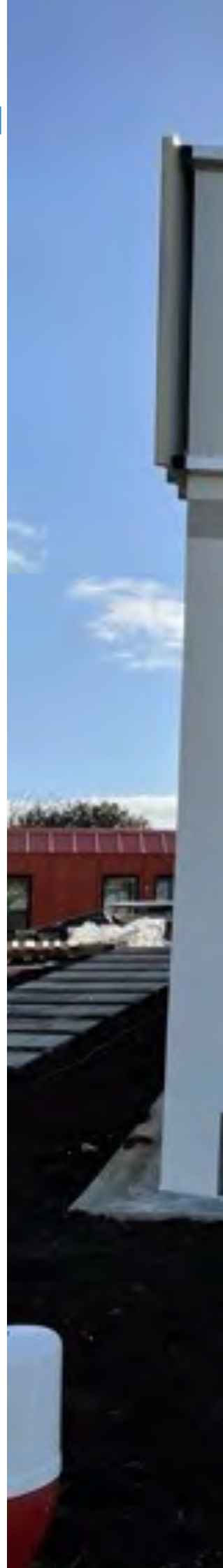




Fig. 16 – Real image of DRS building and AIR Data Center dated March 2022

3.3.3 WORKSHOP WITH AIR CENTRE NETWORK MEMBERS FOR THE IDENTIFICATION OF THE MAIN TECHNICAL REQUIREMENTS FOR THE DESIGN OF THE “ATLANTIC CONSTELLATION”

As the AIR Centre pursues its vision of conceptualizing an infrastructure that integrates the different sciences of Space, Ocean, Climate, Energy and Data Sciences and which is called Atlantic pole to pole observation system of systems (APPOSS), in order to promote an integrated vision for the Observation of the entire Atlantic (north-south/south-north/north-north/south-south). APPOSS architecture includes seven components: Space, Atmosphere, Sea Surface, Underwater, Control Center, Data Management and End User Services (see Figure 17).

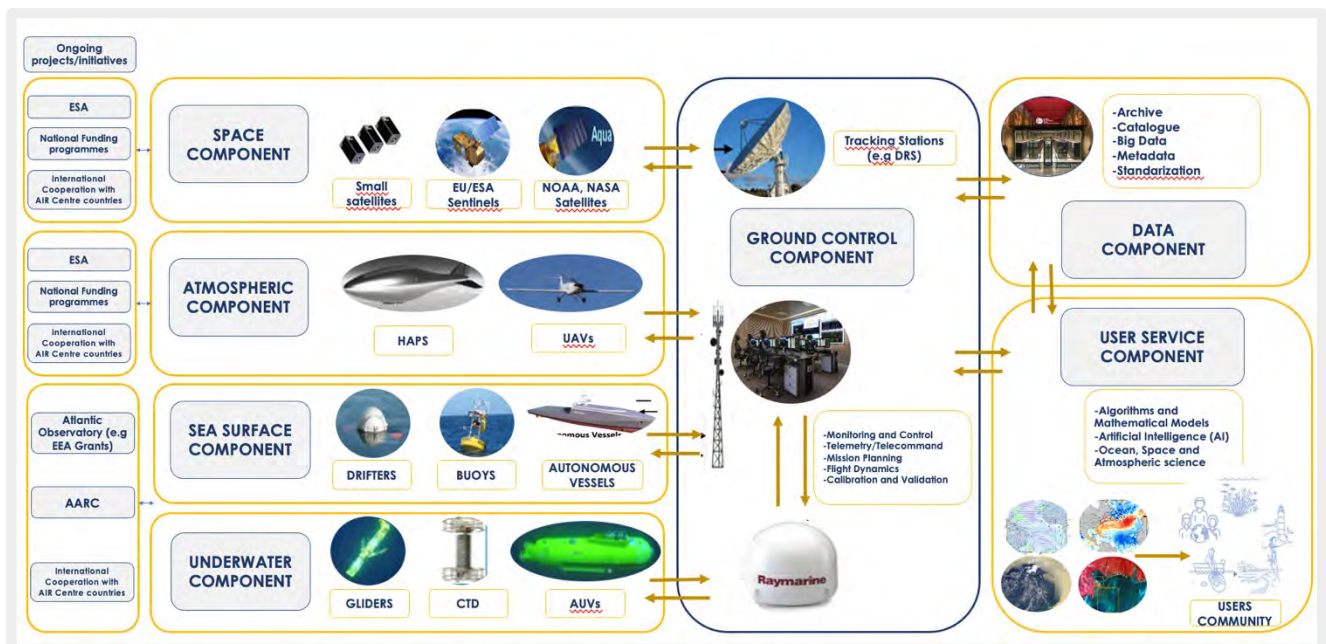


Fig. 17 - Vision architecture for Atlantic pole to pole observation system of systems (APPOSS)

The flagship project of the Atlantic Constellation, part of the view of APPOSS, and considering the evolution of several strategic aspects of this project during 2021, remained defined in the following configuration of the constellation:

1. “upstream” that will be the development of small satellites (see figure 18), of which:

- a.** Sixteen (16), in four orbital planes, integrating four to five (4-5) payloads (hyperspectral camera, GNSS-R system, AIS system and IoT module with 5G protocol), and with the ground segment (i.e., ground station, control and processing center) and launch,
- b.** Three (3), in an orbital plane, integrating two (2) payloads (very high-resolution multispectral camera, and module for optical communications), and with the ground segment (i.e., ground station, control and processing center) and launch.

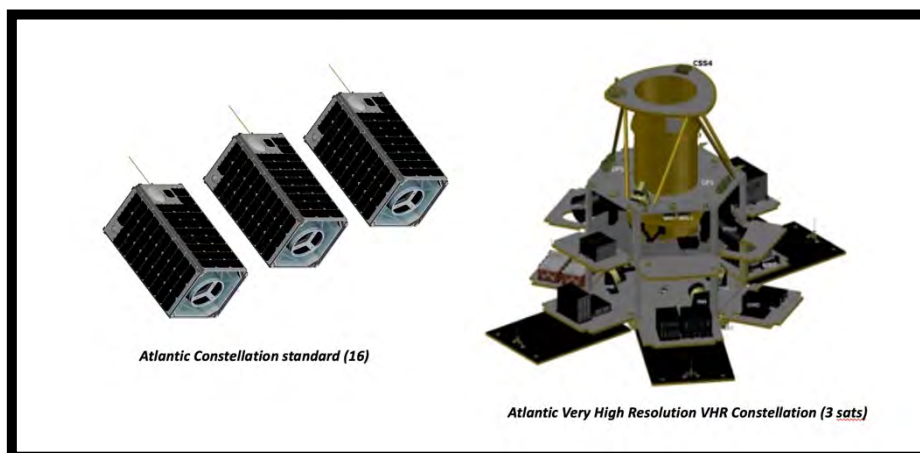


Fig. 18 - Small-satellites concept: 20kg platform - 16 satellites & 80kg platform - 3 satellites

2. “downstream” that 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 and the future, etc.



ATLANTIC CONSTELLATION

Towards an Atlantic Constellation

Workshop on Preliminary User Needs and Requirements

However, to validate the technical proposal for the development of the Atlantic Constellation, the AIR Centre proceeded to involve its network: Portugal Space, CoLab +Atlantic, Mexico (AEM), United Kingdom (Catapult SA), Spain (CDTI), Nigeria (NASRDA), South Africa (SANSA), Norway (NTNU), Egypt (EGSA), Brazil (INPE), and Canada (ASC-CSA), and its users to validate the proposed technical requirements and needs of applications and products.

And so, with the involvement of the various countries of the AIR Centre, the workshop was organized: "Towards an Atlantic Constellation", on 15 and 16 July 2021 in Terceira Island, Azores. A total of 292 participants (researchers, satellite data users, institutional representatives, among other stakeholders).

Five technical sessions were held as part of the AIR Centre missions and the following countries were present (in hybrid format): Brazil, Nigeria, United Kingdom, Mexico, Portugal, Namibia, Ghana, among other Atlantic countries. For the preparation of the workshop, in order to understand the expectations of the participants, a questionnaire was designed for the collection of these same expectations of users: 1) High-level needs, and 2) Technical requirements for instrumentation.

After two intensive days of presentations and discussions, the results obtained during the workshop produced a technical note on the Atlantic Constellation which was distributed to the participants and members of the AIR Centre network. Therefore, it describes some of the main results achieved based on aforementioned survey, such as:

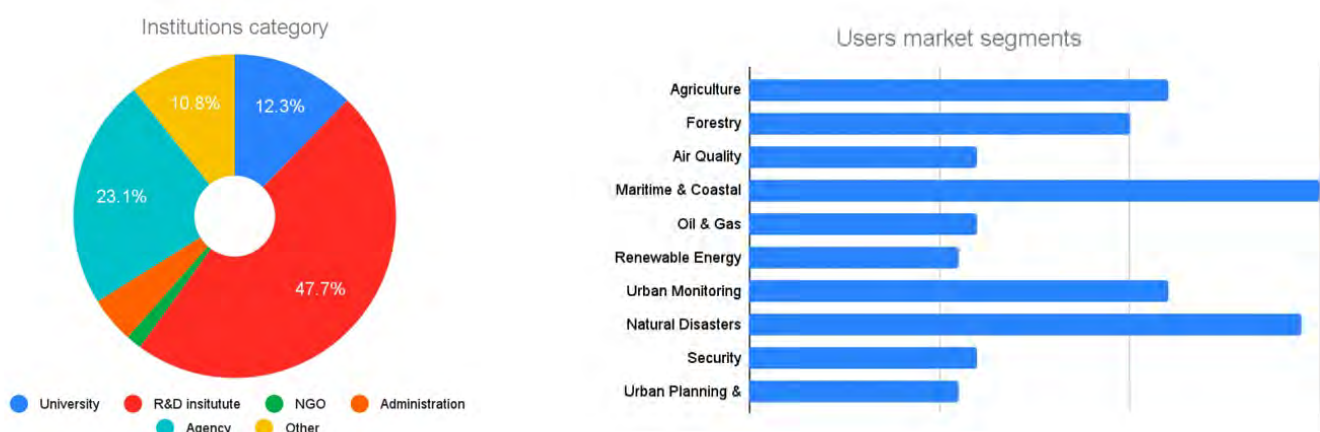


Fig.19 – Global survey statistics: user profile



The entities participating in this workshop represented in a diversified and distributed way (Universities, R&D Centers, NGOs, Public Services, etc.) users of a future constellation for the Atlantic, and were also part of the science and innovation ecosystem of the various countries of the AIR Centre network. Regarding the market segments identified for this constellation, it was concluded that activities in the Maritime & Coastal areas (61%) and Natural Disaster Mitigation (59%) are priorities for users. However, there are other equally relevant segments such as Agriculture and Urban Environment Monitoring (45%).

Therefore, figure 20 shows that the AIR Centre missions are in alignment with a future Constellation for the Atlantic. We can conclude that (61%) of those who answered the questionnaire (mentioned above) are aligned with the Improvement of Environmental and Maritime Monitoring, (51%) with Resilience to Coastal Natural Risks, (48%) with Improvement of the management of Marine and Coastal resources, (34%) with Clean and Productive Bays and Estuaries, and (23%) with Sustainable Food Production.

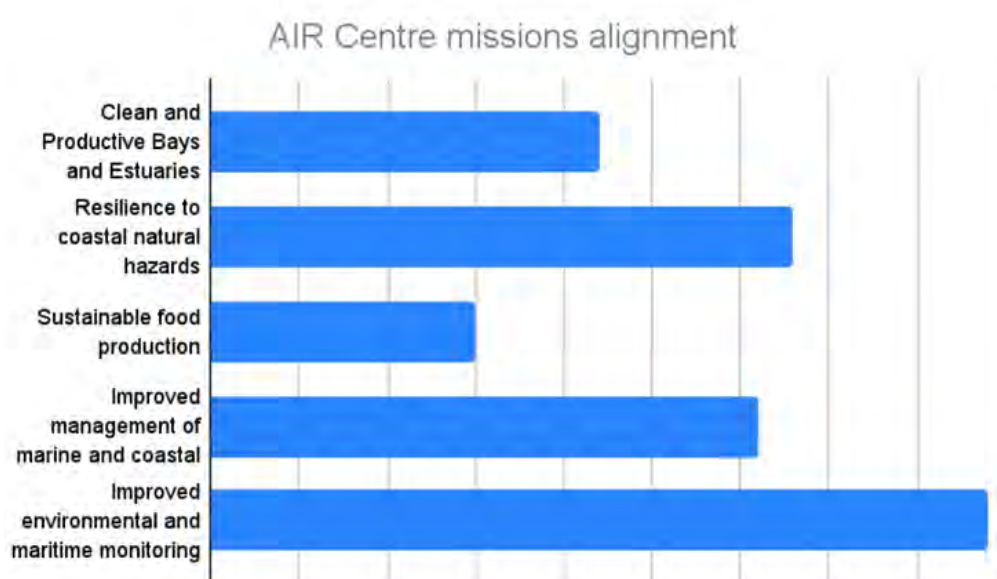


Fig. 20 – Aligning users' needs with AIR Centre missions



In turn, during this workshop it was essential to consolidate the analysis of requirements and payloads that should be on the satellites. Since user needs are prioritized and measures are identified as the key to addressing needs for better science and new innovation/market opportunities, the next step is to identify instruments (payloads) that can provide the expected measures with the necessary accuracy and which are compatible with the limitations of a small satellite (e.g., Active sensors such as SAR, LIDAR, or radar altimeter were not considered as payloads due to their present size and cost). The list for potential payloads for the Atlantic Constellation is as follows:

- Automatic Identification System (AIS) or VHF Data Exchange System (VDES) decoder for monitoring maritime traffic and identifying vessels,
- IoT (Internet of Things) communications transponder, which can incorporate the 5G protocol,
- High resolution (HR) multispectral optical cameras and/or very high resolution (VHR) in visible bands (NIR, SWIR, and TIR) for ocean and terrestrial images and measurements,
- Hyperspectral medium-optical resolution chamber in visible bands (NIR, SWIR, and TIR) for images of phenomena in the ocean (e.g. algal efflorescence monitoring), and
- GNSS-R Sensor for measuring wind speed over the surface, wave height, dominant wave direction, ocean surface currents, ice thickness, soil moisture, flooded areas, among other measurements.

At the conclusion of the workshop, some of the expected characteristics of the satellite were also mentioned:

- Nanosatellite of 12-16 U (20 x 20 x 30-40 cm), with a total mass of about 15-25kg,
- Solar panels should be able to generate 25-30W,
- Downlink capacity of 500 Mbps in X or Ka Bands, with uplink capacity of 250 Kbps in S band or VHF,
- There must be at least 256 GB of on-board memory storage,
- There must be a propulsion system (preferably electric propulsion).

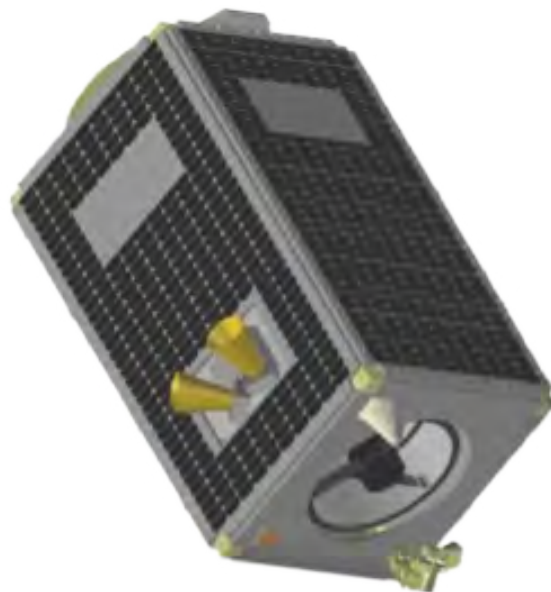


Fig. 21 – Mockup of (1) nanosatellite planned for the Atlantic Constellation



Photo by NASA on Unsplash



3.3.4 IMPLEMENTATION OF THE STRATEGIC PROGRAMME ORIENTED TOWARDS THE ATLANTIC WITHIN THE PORTUGUESE CHAIRMANSHIP OF THE EUREKA NETWORK IN THE PERIOD 2021-22

Eureka is an intergovernmental network of national funding agencies under the responsibility of ministries responsible for research and innovation policy. The network supports market-oriented research, development, and innovation (R&D&I) projects for companies, universities, and research organisations in all areas of technology (Eureka Strategic Roadmap, 2021-2027).'

The AIR Centre was appointed by the Ministry of Science, Technology and Higher Education to assume the Chairmanship of Eureka, representing Portugal, in the period - 1 July 2021 to 30 June 2022.



Portugal is a founding member of this network and remains very committed to Eureka's success as an international collaborative network for R&D&I, where research and industry work to develop new products and services close to the market through a flexible and dynamic model. In the past, Portugal held the chairmanship of Eureka in 1997-98 and in 2008-09, when it opened Eureka to Asia, first to China and in 2009 supported South Korea to become an associate member.

The Portuguese Chairmanship of the Eureka network in 2021 followed up the presidency of the Council of the European Union (January-June 2021) and ran alongside Portugal's co-presidency at the Council of the European Space Agency (ESA) at ministerial level, also during the year 2021. Both dynamics were certainly unique synergies that also allowed for the promotion of new programs and activities within the Eureka Network. The current strategy of the Portuguese Chairmanship is reflected in the motto: "Innovation for a Greener, Digital and Healthier Planet through a collaborative approach".



PRIORITIES OF THE PORTUGUESE CHAIRMANSHIP OF EUREKA

Increase the global reach of the Eureka network

- Encourage global collaboration in R&D&I with non-European countries that can enhance renewed dynamism and add value to the EUREKA network,
- Explore opportunities for global cooperation, particularly in Africa (e.g., Nigeria, Kenya, Morocco), South America (e.g., Mexico, Colombia and Brazil),
- Boost Globalstars calls and explore this opportunity with new member countries,
- Promote collaboration with international organisations with an important innovation component, such as the European Space Agency (ESA),
- Organize a series of international events called: "Eureka meets the Atlantic through collaborative innovations between the Space-Ocean-Earth sectors", in Portugal, USA, South Africa, Brazil, and Norway.



Stimulate new forms of cooperation for R&D&I programs

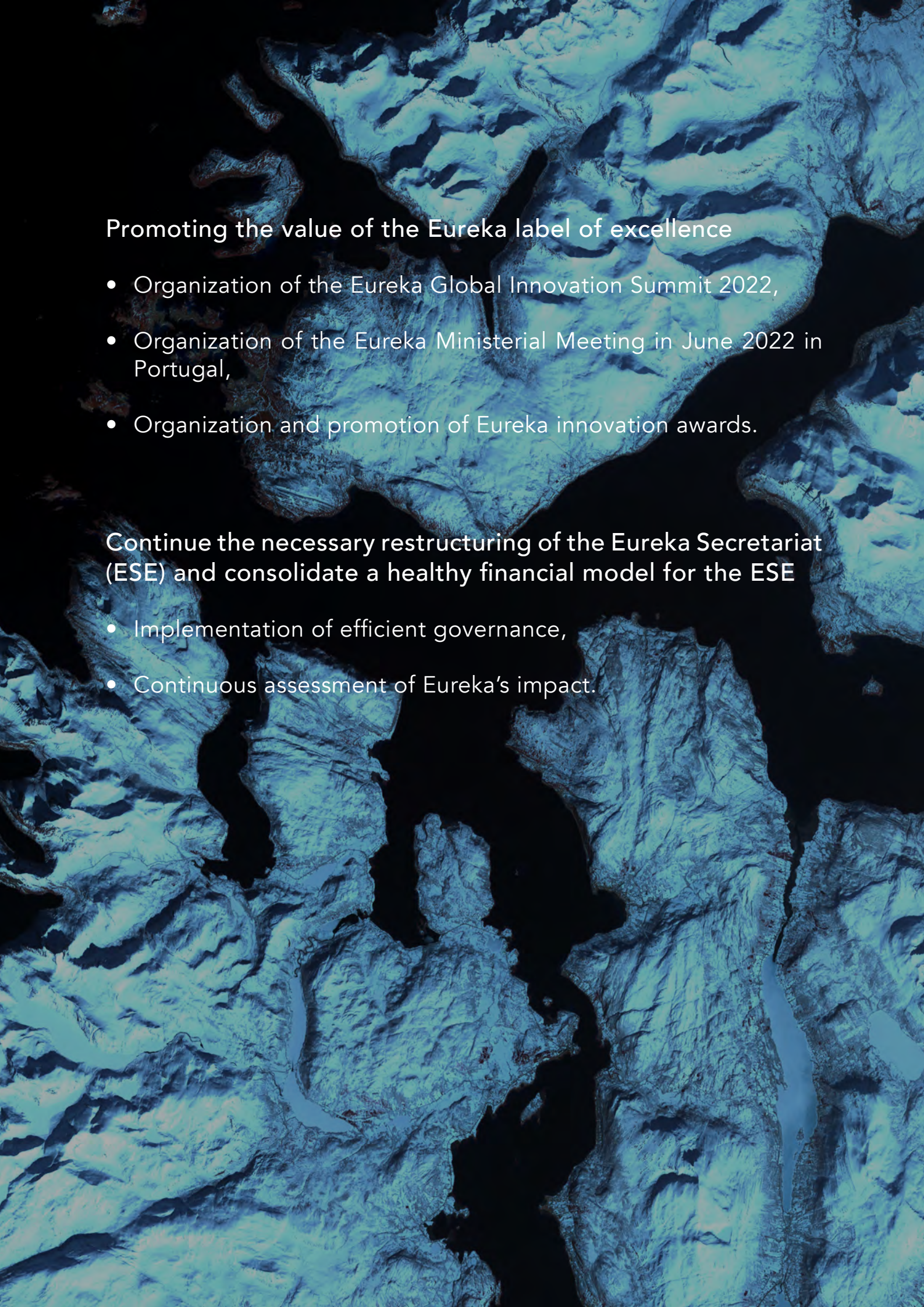
- Strengthen the relationship with the European Union under the new Horizon Europe framework programme for R&D&I, including EU missions, as well as to promote links with the Green Deal by consolidating new collaborative programmes: Innowide, InvestHorizon, and launching Eurostars-3 through the new “Innovative SMEs” Partnership, ensuring its insertion in the future Fast Accelerator-track.
- Strengthening the relationship with the European Institute of Innovation and Technology (EIT) and the EU New Generation.
- Launch of the Eurostars-3 Program, scheduled to start in the 2nd half of 2021.
- Strengthen synergies with the national R&D&I instrument.
- Support cooperation activities in non-EU countries to increase their participation.
- Encourage the incorporation of new members.



PRIORITIES OF THE PORTUGUESE CHAIRMANSHIP OF EUREKA

Strengthen the positioning of the Eureka Network by strengthening project generation mechanisms

- Contribute to the promotion of the Eureka Clusters Program through the implementation of a new governance model, ensuring greater commitment of public authorities in project financing, intensifying the participation of key industrial actors in cluster governance structures and promoting collaboration and “cross-fertilization” between Clusters through the organization of joint calls,
- Promote a joint thematic call with a topic focused on Space-Ocean-Earth Observation Systems and space-related technologies that would include:
 - Promotion of projects associated with the “Green Deal” in areas such as Earth Observation from Space,
 - Increase synergies between Space - Ocean - Atmosphere - Climate leading to the concept of “Earth Digital Twin”, and
 - Promotion of Artificial Intelligence (AI) and its combination with data from Earth Observation systems.
- Encouraging networking for Europe-Africa and Europe-Latin America interactions,
- Ensure an active dialogue with the main industry players, since Eureka is a bottom-up organization and triggers key thematic projects for the industry (Multinationals, SMEs, start-ups, sector clusters and industrial associations),
- Promote as far as possible the synchronization of evaluation and funding between the members/associates of the Eureka Network.



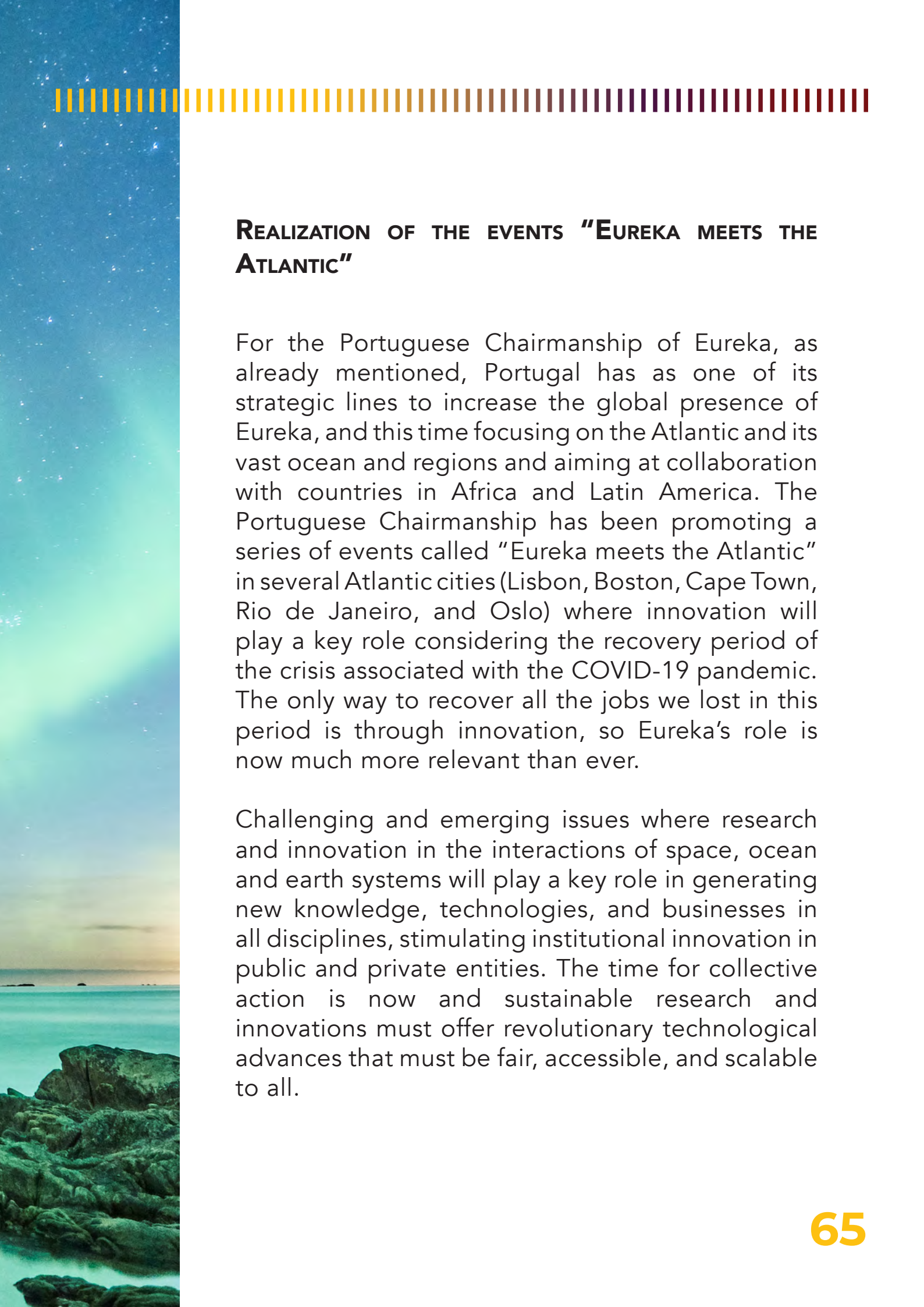
Promoting the value of the Eureka label of excellence

- Organization of the Eureka Global Innovation Summit 2022,
- Organization of the Eureka Ministerial Meeting in June 2022 in Portugal,
- Organization and promotion of Eureka innovation awards.

Continue the necessary restructuring of the Eureka Secretariat (ESE) and consolidate a healthy financial model for the ESE

- Implementation of efficient governance,
- Continuous assessment of Eureka's impact.





REALIZATION OF THE EVENTS "EUREKA MEETS THE ATLANTIC"

For the Portuguese Chairmanship of Eureka, as already mentioned, Portugal has as one of its strategic lines to increase the global presence of Eureka, and this time focusing on the Atlantic and its vast ocean and regions and aiming at collaboration with countries in Africa and Latin America. The Portuguese Chairmanship has been promoting a series of events called "Eureka meets the Atlantic" in several Atlantic cities (Lisbon, Boston, Cape Town, Rio de Janeiro, and Oslo) where innovation will play a key role considering the recovery period of the crisis associated with the COVID-19 pandemic. The only way to recover all the jobs we lost in this period is through innovation, so Eureka's role is now much more relevant than ever.

Challenging and emerging issues where research and innovation in the interactions of space, ocean and earth systems will play a key role in generating new knowledge, technologies, and businesses in all disciplines, stimulating institutional innovation in public and private entities. The time for collective action is now and sustainable research and innovations must offer revolutionary technological advances that must be fair, accessible, and scalable to all.

The “Eureka meets the Atlantic” series of events is a platform for international dialogue, project idealization, global business partnerships and a show of scalable innovations that include existing and new actors, promoting scientific and technological applications, products, and services for the inclusive benefit of international communities working for a greener, digital and healthier planet. Certainly, the “Eureka meets the Atlantic” events will also contribute to the success of the priorities of the Portuguese Chairmanship. (see Annex 5 - Eureka Presidency team)

In summary, the following two figures (fig. 22 and fig. 23) illustrate the calendar of the Portuguese Chairmanship during the 2021-2022 period and in particular the dates for the holding of the (5) events “Eureka meets the Atlantic”.

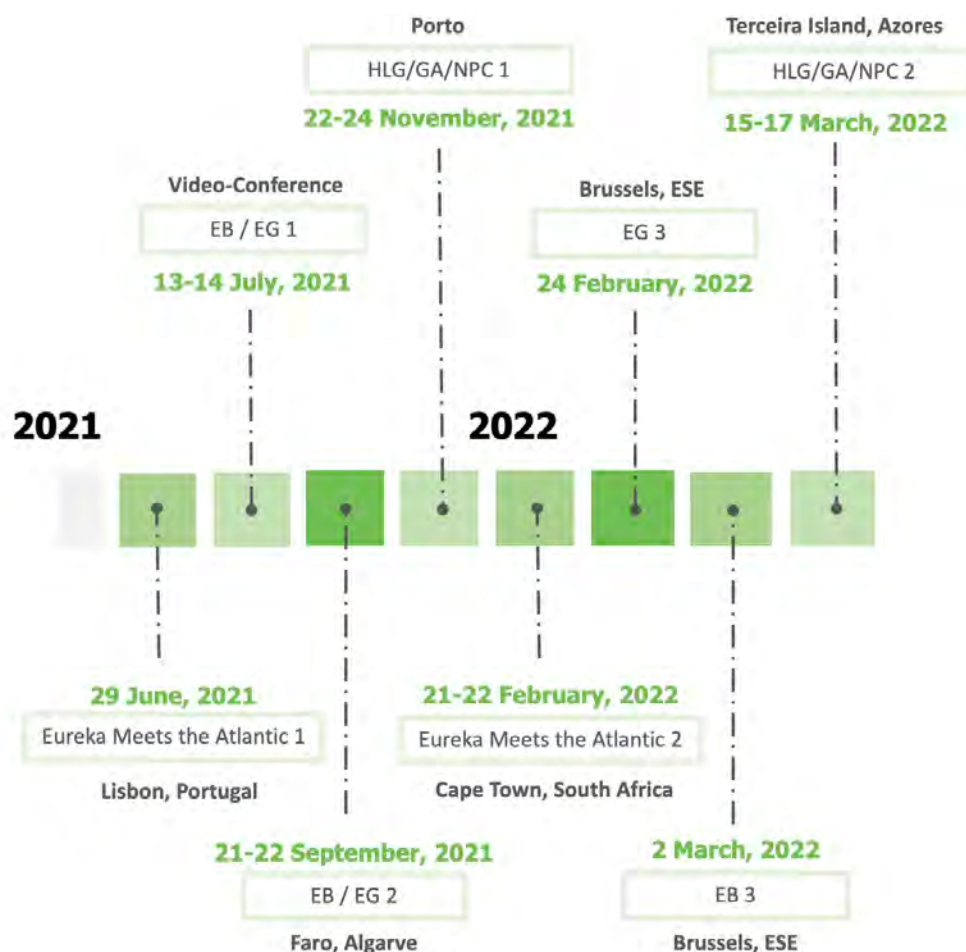
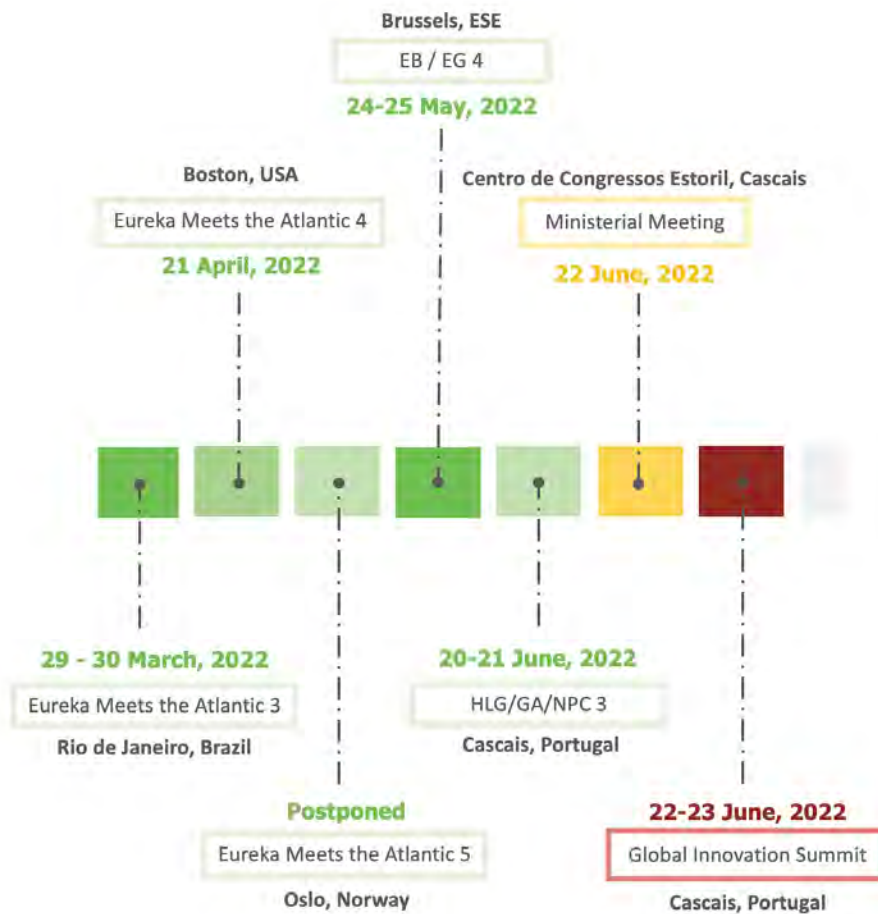


Fig. 23 – Calendar of the Portuguese Chairmanship of Eureka



Fig. 22 – Dates planned for the events “Eureka meets the Atlantic”



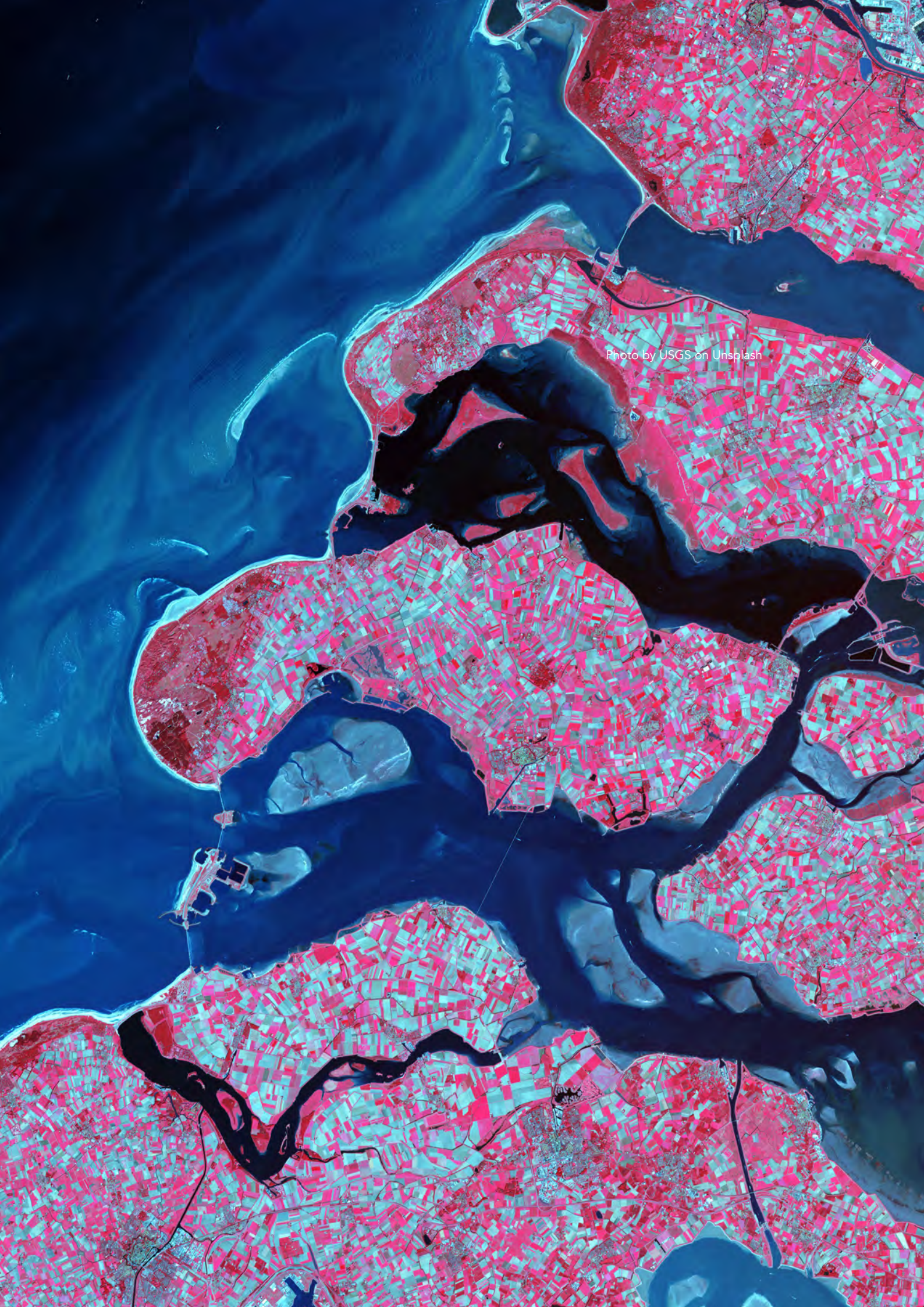


Photo by USGS on Unsplash



3.3.5 CONTINUATION OF THE ACTIVITIES OF THE AIR CENTRE SCHOLARSHIP PROGRAM

In 2020, the AIR Centre signed a protocol with the Foundation for Science and Technology I.P. (FCT) with a view to funding twenty (20) doctoral research grants per year until 2023, in a total of sixty (60) grants 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 2021, two international competitions were opened with a view to awarding 21 doctoral scholarships in the following areas:

- Data Science;
- Health (e.g EO for public health);
- Ocean Accounting;
- Marine Robotics;
- Biodiversity;
- Earth Observation;
- Bioeconomy;
- Blue Growth;
- Circular Economy;
- Ecosystems;
- Natural Sciences;
- Computer Science.

Since the beginning of the program, with the motto: “Training the leaders of the future” we opened 3 contests (2 contests in 2021) and we had candidates from about 30 different countries: Brazil, Argentina, India, Bangladesh, Ireland, Portugal, Venezuela, Spain, Iran, Pakistan, USA, China, Egypt, Mozambique, Cape Verde, Angola, Italy, England, Colombia, Poland, Germany, Nigeria, Ethiopia, Lanka, Kenya, The Netherlands, among others.

During 2021, we received more than 60 applications from 19 countries and new collaborations were established between Portuguese and foreign academic institutions and research centres (see figure 24). Women accounted for 35% of applications and 50% of selected students.



Fig. 24 – Instituições académicas e centros de investigação portuguesas e estrangeiras em colaboração no âmbito do programa de bolsas do AIR Centre



4. Earth Observation Laboratory (EO Lab) Growth

The energetic continuation in the consolidation of the activities of the Earth Observation Laboratory (EO Lab) of the AIR Centre located in the Science and Technology Park – TERINOV, Terceira Island, Azores, with regard to the initiatives of the Azores ESA_Lab, MBON Secretariat and connection to the fundamental science activities of A-RAEGE-Azores, and complementing the installation of the DRS antenna and the AIR Data Center, continued during 2021. The EO lab aims to establish an institutional link between research entities and the European Space Agency (ESA) to explore innovative applications of Space Earth Observation (EO) technologies in the Atlantic area. The EO Lab is also part of the GEO (Group on Earth Observations) Thematic and Regional Blue Planet Node, as well as GEO-MBON (Group on Earth Observations - Marine Biodiversity Observation Network, MBON).

During 2021, EO Lab contributed to maximising the integration of a distributed space ecosystem, extending the use of space technologies and applications to support societal challenges, public domain needs and policies in the Atlantic area and contributing to a better knowledge of areas still under studied in the framework of the AIR Centre missions. It has also been a laboratory for testing procedures and methods to connect peripheral regions to globally competitive technological sectors, based on research, innovation, and entrepreneurship. The objective is to establish a collaborative structure to identify, consolidate, sustain, stimulate, promote, and build capacity for existing, new and future EO-based services for Atlantic Ocean countries at regional, national and internationally scalable level.

The EO Lab team continued its diversification during 2021 (see figure 25), having covered the following specialties and academic backgrounds in its technical team: Biotechnology, Marine Biology, Computer Science, Oceanography, Biomedical Sciences, Aerospace Engineering, Aeronautics and Terrestrial Resources.



Fig. 25 – Photo illustrating EO Lab technical team captured during AIR Centre event in TERINOV, Terceira Island

Throughout the year 2021, priority was given to identifying synergies between existing projects, proposals, infrastructures, the MBON secretariat with the thematic missions of the AIR Centre. Therefore, during 2021, a total of 33 proposals were drawn up and several projects started, and others continued being implemented. The following results of the EO lab stand out:

- Projects related to the satellite constellation ATON and SPACE4Atlantic (ESA) have begun and the MAGAL and AEROS (PO-Azores) projects continue with the detailed definition of payloads and mission,
- Participation in the National Digital Innovation Hubs for the Blue Economy and Agriculture was accepted, allowing the entry into future new Earth Observation projects,



- The alert system for farmers in the Azores, SAP project (PO-Azores), continued allowing the development of an inter-island internet of things (IoT) network to support new applications and services for industry and academia, combining in-situ sensors with remote detection technologies,
- LABPLAS (H2020), Port XXI, ARIA2 and ARIA3 (ESA) projects started or continued, aiming at detecting plastics in the ocean, combating port pollution and energy solutions using space Earth Observation technologies,
- A study called MARBIOME has been approved within the European Commission (EC) to study the current state of marine biodiversity monitoring in the European Union and adjacent marine waters, which could open new avenues for future projects where EO-derived Essential Ocean Variables (EOVs) will play a key role in biodiversity monitoring,
- Several projects under the European EO Programme (FPCUP) have been initiated and others continue to increase and support the importance of defining new Copernicus-based products and services. Examples include collaboration with European SMEs, taking them to different regions of the Atlantic (such as South Africa and Brazil) to increase Copernicus uptake in different areas and markets,
- Organization of dedicated meetings with ESA and the Portuguese Space Agency (PT Space) to coordinate the activities of the ESA_Lab,
- The internationalization of the activities of the AIR Centre with the IntAIRsect project (PO-Azores), which connects the regional entities of the Azores to the international networks of the AIR Centre, and which includes researchers, companies, and other entities of the national scientific and technological system,
- Submission to the National Innovation Agency (ANI) of Portugal of the proposal to create a Technology-Free Zone (ZLT) in the Azores and Terceira Island in Angra do Heroísmo;
- A total of four technical publications at relevant international conferences.



4.1 SECRETARIAT OF THE MARINE BIODIVERSITY OBSERVATION NETWORK, MBON

The Marine Biodiversity Observation Network (MBON) is a “coalition of willing” 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 topic of the GEO BON, 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 Biodiversity Variables (EBVs), which can be used to track ecosystem changes such as the abundance, distribution, and diversity of organisms in the ocean. By 2020, the MBON Secretariat was already 100% operational with two (2) highly qualified human resources dedicated to ongoing activities and during 2021, the activities of the MBON Secretariat at the AIR Centre included tasks related to:

- coordination (organisation of MBON meetings with co-chairmen and the management committee and their minutes of the meetings),
- networking (for capture of other marine networks, working groups and organizations related to marine biodiversity),
- communication (mailing-list management, social networks and MBON website update), and
- scientific dissemination (series of monthly webinars entitled “Marine Biodiversity Networking Fridays”).





In addition, the MBON secretariat promoted partnerships with key marine partners and organizations, including the establishment of memoranda of understanding; obtaining funding through the development and submission of proposals for competitions related to the area of marine biodiversity.

In addition, the secretariat organized workshops and seminars and participated in scientific dissemination events with different oral communications, produced different scientific publications, as well as dissemination news and participated in advanced training actions. In addition, the MBON secretariat has been co-ordinating the UN programme: ("Ocean Decade endorsed marine life programme 2030").

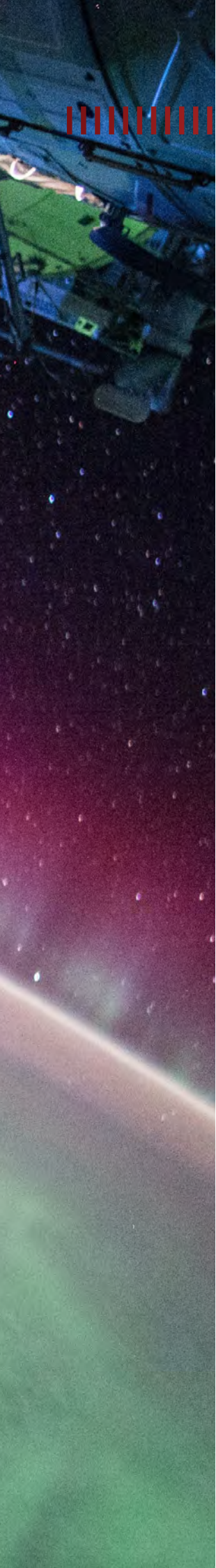
The following table no. 2 presents the general list of productivity indicators developed by the MBON secretariat during 2021.



Table 2 – Lista de indicadores de produtividade do secretariado MBON durante 2021

DESCRIPTION	TOTAL
1. Publications	2
2. Communication in scientific meetings	3
3. Organizing congresses, workshops, seminars	2
4. Participation in events for scientific dissemination, workshop and exhibits	20
5. Advanced Training	1
6. Produced Dissemination Material (Audio, Visual, and Digital Materials)	3
7. Dissemination News	9
8. Submitted / In process Proposals	7
9. Approved Projects	2
10. Networking	
10.1 Partners with MoUs	3
10.2 Informal Partners	7





4.2 A-RAEGE-AZORES

It is important to remember that the national strategy of research, innovation and growth “Portugal Space 2030” aims, among other things, to stimulate the exploration of data and spatial signals through space-based services and applications and empowered by space technologies, in which the location of the Azores is of particular importance for its geostrategic position. In this context, the AIR Centre considers it important to leverage the network of existing scientific infrastructures in north-south/south-north cooperation in the Atlantic.

The Atlantic Network of Geodynamic and Space Stations (RAEGE) incorporates an infrastructure of the ground segment with potential scientific and technological growth, in which geodesy and geodynamic studies are being developed based on various observation techniques, in particular the Very Long Baseline Interferometry (VLBI) geodetic, Global Navigation Systems (GNSS) and radio astronomy and Space Situational Awareness (SSA) studies.

The operational link between the AIR Centre and the A-RAEGE-Az infrastructure was consolidated during 2021, with the various activities carried out by two (2) AIR Centre employees who live on the island of Santa Maria and work locally in this scientific infrastructure, and these activities were:

- Study on the spatial geodesic techniques present at the RAEGE station of Santa Maria: VLBI ("Very Long Base Line Interferometry") and GNSS ("Global Navigation Satellite System"),
- Operation of VLBI observations ("Very Long Base Line Interferometry") geodesic in the scope of the consortium with the ("International VLBI service (IVS)"),
- Preparation and development of procedures for VLBI observations,
- Troubleshooting, calibration and maintenance of station equipment with preparation of the respective technical reports,
- Analysis of VLBI data corresponding to observations made by RAEGE station of Santa Maria with the objective of troubleshooting and evaluation of data quality,
- Research in GNSS with exploratory character, focusing on techniques of treatment and data analysis for studies of the ionosphere and the impacts of solar energy events,

- Research in radio astronomy focused: i) on the analysis of the geometry of the magnetic field of solar flares, in particular in its microwave emission component, and ii) on the relationship between manifestations of solar activity and solar energy particles from the solar atmosphere impacting the Earth's atmosphere,
- Search for scientific partnerships within the station's activities, and
- Technical training on VLBI at RAEGE Yebes station (Nov 2021).

Participation in Congresses and Conferences:

DATES	EVENT
12 March	EARTO Annual Conference 2021
14-18 March	25th EVGA Working Meeting 2021
28 June - 2 July	IAG Scientific Assembly 2021, Splinter meeting of the "Inter-Commission Committee on "Geodesy for Climate Research" (ICCC)
15-16 June	Preliminary User Needs and Requirements - Atlantic Constellation Workshop
11-13 October	GGOS Days 2021
28-29 October	2nd EU-VGOS Workshop
11-12 November	Conferência Internacional para a apresentação da Estratégia dos Açores para o Espaço

5. EXPANSION OF THE DISTRIBUTED NETWORK IN THE ATLANTIC

During 2021 the process of consolidating and extending the AIR Centre network and the development of international cooperation in the Atlantic continued, and new bilateral partnerships and agreements were established. This cooperation resulted in the formalization of memoranda of understanding, affiliation agreements and protocols of intent, as listed in table 3 below:

Table 3 – Agreements and MoUs signed in 2021

SIGNATORY ENTITY	COUNTRY	SIGNED BY:
Protocol for Cooperation between PCTTER and the AIR Centre	Portugal	Miguel Belló Mora, CEO AIR Centre and Duarte Pimentel, Executive Director of TERINOV
Memorandum of Understanding between Deimos and AIR Centre	Portugal	Miguel Belló Mora, CEO AIR Centre and Nuno Ávila General Manager DEIMOS
Mutual Non-Disclosure agreement between Deimos and AIR Centre	Portugal	Miguel Belló Mora, CEO AIR Centre and Nuno Ávila General Manager DEIMOS
Protocolo de Colaboração entre a Camara Municipal de Angra do Heroísmo, AIR Centre e o TERINOV	Portugal	Miguel Belló Mora, CEO AIR Centre and José Alamo de Meneses, President of CMAH; Duarte Pimentel, Executive Director of TERINOV
Contrato de Rede de Ciência e Tecnologia para a Criação do Observatório do Atlântico	Portugal	Miguel Belló Mora, CEO AIR Centre and Universidade do Aço, Maria Gabriela Queiroz; IPMA, Jorge Miranda; IH, Carlos Soares; Estrutura de Missão para a Extensão da Plataforma Continental, Nuno Paixão; Associação para o Desenvolvimento e Formação do Mar dos Açores, Manuel São João; FRCT, Bruno Teixeira;
Contrato Consorcio entre a UNICOL, AIR Centre e a PCTTER	Portugal	Miguel Belló Mora, CEO AIR Centre and UNICOL João Rodrigues do Couto e Tiago Ferreira; PCTTER
Memorandum of Understanding Between AIR Centre and RCM (Regional Marine Center)- University of Ghana	Ghana	José Moutinho Neto, AIR Centre e RMC, Kwame Adu Agyekum
Memorandum of Understanding Between AIR Centre The Benin Institute for Halieutic and Oceanographic Research (IRHOB)	Ghana	José Moutinho Neto, AIR Centre ; IRHOB, Zacharie Sohoun

6. PROJECTS APPROVED IN 2021

6.1 DEVELOPMENT OF PROJECTS IN THE ATLANTIC

In 2021, the AIR Centre continued its operational strategy for implementing the Atlantic Interactions agenda, both in the national and international context, with participation and development of new proposals and projects in and with the network. Between 2019 and 2021, about 103 proposals were submitted to national and international competitions, with 25 projects approved, always in consortium with several partners, namely companies, research & technology centres, universities or public institutions from AIR Centre member countries, and in the total of those projects the requested budget represented an approximate volume of 37M€ (approximately € 2 million are executed by the AIR Centre technical team during the project implementation period). Accordingly, the following are the projects which were approved in 2021 (see table 4):

Table 4 – List of projects

PROJECT NAME	FUNDING BODY
Incubed #1: ATON – “Identification of gaps for a small-satellite constellation for the Oceans”	European Space Agency (ESA)
Incubed #2: Space4Atlantic – “De-risking study for a technical and economic feasibility analysis for a small satellite constellation”	European Space Agency (ESA)
Sistema Alerta Pithomyces (SAP) – Sistema web de monitorização e alerta de risco de exploração do fungo Pithomyces	PO Azores 2020
EOATSEA – “Exploitation of the latest advances in EO technology, complemented by models and in-situ observation”	European Space Agency (ESA)
MARBIOME – “Marine Biodiversity Monitoring in the European Union and adjacent marine waters study”	European Commission (EC)
Copernicus Uptake in Portuguese Higher Education (“under budget re-negotiation)	European Commission (EC)
Copernicus Uptake for the Maritime Sector (under budget re-negotiation)	European Commission (EC)
Coastal Coordination of User Needs and Methodologies (under budget re-negotiation)	European Commission (EC)
Copernicus User Uptake in Africa (under budget re-negotiation)	European Commission (EC)

As aforementioned, the five (5) missions of the AIR Centre support the Atlantic cooperation strategy and in this context, the image below (see figure 26) illustrates all the ongoing projects and how they align with the missions and components of the AIR Centre APPOSS.

PROJECTS	AIR Centre's Missions					Observation Segment				Control, Data and Service Segment		
	Clean and Productive Bays and Estuaries	Resilience to Coastal Natural Hazards	Sustainable Food Production	Improved Management of Marine and Coastal Resources	Improved Environmental and Maritime Monitoring	Space Component	Atmospheric Component	Sea Surface Component	Underwater Component	Ground Control	Data Component	User Service Component
MISSION ATLANTIC												
NEXTOCEAN												
IntAIRSect												
CE2COAST												
FPA-CUP												
MAGAL												
LABPLAS												
ARIA 2												
ARIA 3												
ASTRAL												
AEROS												
K2D												
PORTS XXI												
ESDES												
MBON												
MARBIOME												
SAP												
ATON												
SPACE4Atlantic												

Fig.26 – Relation between projects and five (5) AIR Centre missions and APPOSS components



7. PROMOTION OF ACTIONS 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 in the network and that increase the institutional visibility of the AIR Centre as a main actor of the Atlantic Interactions. Table 5 briefly describes each event and is published in detail on the AIR Centre website:





Table 5 – Eventos em 2021

Date	Location/Country	Event
January - December	Several (Online)	Networking Fridays (28)
9-10 April	Terceira/Portugal (Hybrid)	New developments and future prospects / Atlantic Observatory
21-22 April	Several (Online)	Climate Science from Space
28 April	Several (Online)	Workshop project E5DES, April 28th
27-28 May	Ponta Delgada, Portugal (Online)	Spring Seminar – Biodiversity and Islands
2-4 June	Ponta Delgada, Portugal (Hybrid)	ALL-Atlantic 2021
2-3 June	Several (Online)	Side events -All atlantic 2021 (8)
8 June	Several (Online)	Ocean Exploration, Ocean Science and Ocean Technology:yesterday, today and tomorrow
28-30 June	Several (Online)	International Workshop for the Integrated Development of Sustainable Technologies in Energy, Oceans and Health
15-16 July	Terceira, Portugal (Hybrid)	Towards an Atlantic Constellation
March - October	CPLP Countries (Online)	Science Debates in Portuguese (6)
4-8 October	Rio Janeiro, Brazil (Online)	II International Seminar on Disaster Denaturalization and Community Mobilization
8 October	Several (Online)	First Meeting AIR Centrel Caribbean
12 November	Several (Online)	MARINE BIODIVERSITY NETWORKING FRIDAYS (1)
18-19 November	Several (Online)	Workshop on Remote Sensing and Smart Tech for Marine Litter
March - November	Several (Online)	ONWARD Webinar (5)

7.1 NETWORKING FRIDAYS

The Networking Fridays webinar series began on April 24, 2020, as a way to bring people together during a time of uncertainty and social distancing, a result of the COVID-19 pandemic. With the great success of these webinars, during 2021, Networking Fridays sessions continued every week on Fridays, providing the opportunity for researchers, innovators, entrepreneurs, representatives of multilateral organizations, and government officials to informally discuss their work with the audience and explore paths for future collaboration. The statistics regarding the participation of the Atlantic community between 2020 and 2021 are listed in figure 27:

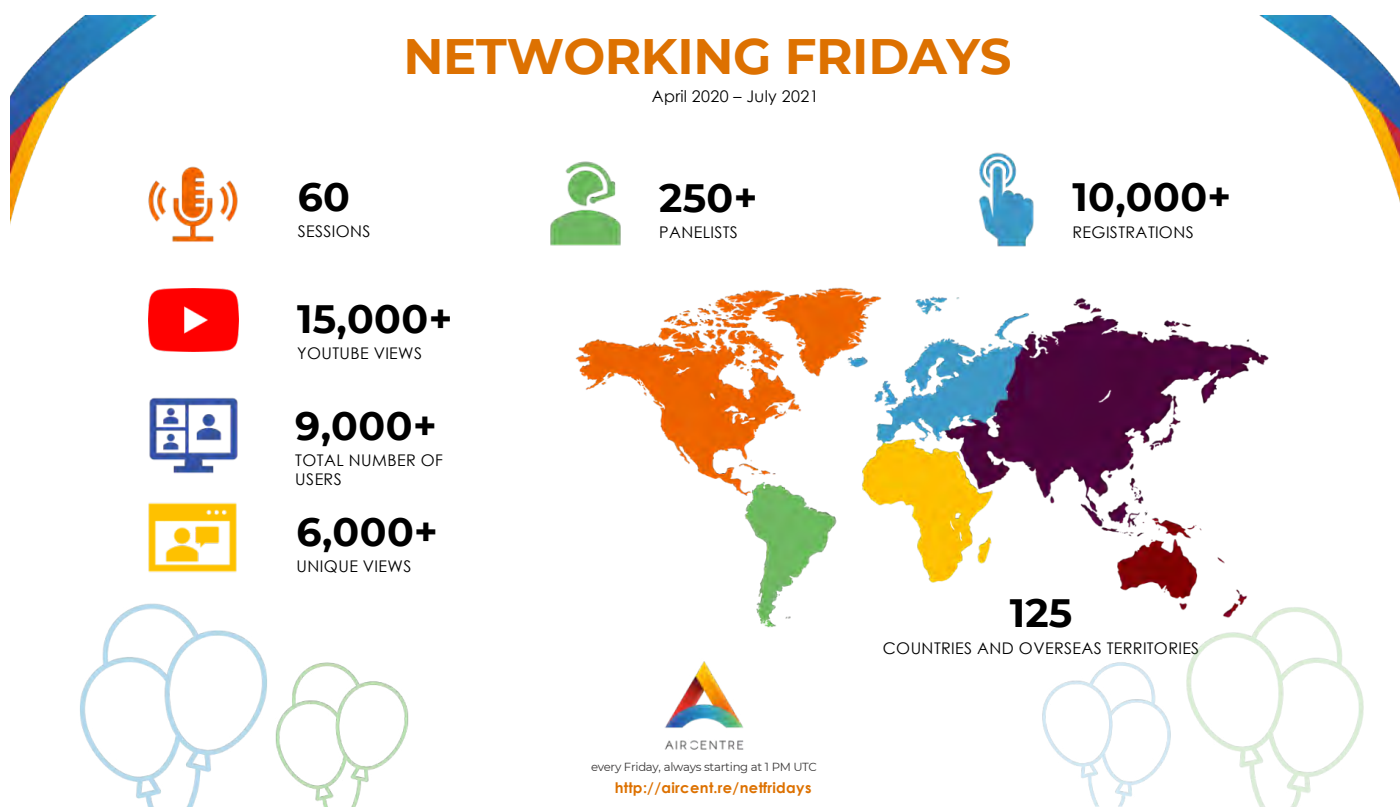


Fig. 27 – Statistics of the participation of the Atlantic and International community in the AIR Centre Networking Fridays

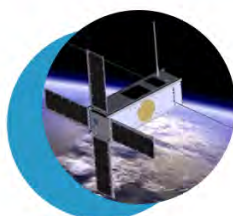
The goal of Networking Fridays is to keep the network active, connected and informed about activities of interest that are taking place in the Atlantic region. During 2021, charismatic speakers and moderators from the Atlantic community participated and interactive discussions were held with thousands of proactive spectators from more than 125 countries globally. Recordings of most sessions are available on the AIR Centre's Youtube channel.

In the year 2021 the following sessions of networking Fridays took place with the following speakers:



15 January - Craig McLean (NOAA)
The Opportunity of the Ocean Decade
Moderator: Larry Mayer (University of New Hampshire)

22 January - Susana Barbosa (INESC TEC)
The SAIL campaign - new observations for the study of space-atmosphere-ocean interactions
Moderator: Tânia Li Chen (AIR Centre)



19 January - Thematic Special Session on Nanosatellites
 Roger Walker (ESA), Milton Kampel (INPE), Stewart Bernard (SANSa), Ernest Teye Matey (AFCONSAT)
Moderator: André Oliveira (CoLab +ATLANTIC)

5 February - Marco Tedesco (University of Columbia)
The cost of floods: how rising waters will reshape our lives and our economy
Moderator: José Luiz Moutinho (AIR Centre)



2 February - David Obura (CORDIO East Africa)
Coral Reef Monitoring, Indicators and Sustainability
Moderator: Ruy K.P Kikuchi (UFBA)

19 February - Simonetta di Pippo (UNOOSA)
#buildbackbetter: Science technology for economic development
Moderator: Miguel Belló Mora (AIR Centre)





26 February - The Fulbright Portugal Program

Otilia Macedo Reis (Fulbright Portugal Programme), Elliott Hazen (NOAA), Xinlian Liu (Hood College, Maryland), Stuart Batterman (NIOSH-supported Education and Resource Center), Anabela Maia (Rhode Island College), Sofia Cordeiro (FCT)

Moderator: Regina Duarte (University of Aveiro)

5 March - Science for All with Ciencia Viva

Ciência Viva Science Club of the Moimenta da Beira School Group, Climate Detectives (ESA) Grouping of Schools Dr. Laura Ayres, Rosalia Dias (Ciência Viva)

Moderator: Ana Noronha (Ciência Viva)



12 March - Jim Costopulos (Global Oceans)

The Future of Ocean Science: Building Scale and International Collaboration

Moderator: Charles J. Vörösmarty (CUNY)

19 March - Konstantinos Topouzelis (UAegean)

Fighting the ocean plastic pollution with the use of the satellite images and drone data: Plastic Litter Project (PLP), history and future steps

Moderator: Leah Mupas Segui (Pew Charitable Trusts)



26 March - Ecosystems Health and Resilience with IB-S

Claudia Pascoal (University of Minho), Filipe Costa (University of Minho)

Moderator: Eduardo Pereira (University of Minho)

9 April - The Portuguese Hydrographic Institute

Miguel Bessa Pacheco (Portuguese Hydrographic Institute), João Vitorino (Portuguese Hydrographic Institute)



16 April - Geo Blue Planet

Emily Smail (GEO Blue Planet), Audrey Hasson (GEO Blue Planet)

Moderator: Leah Mupas Segui (Pew Charitable Trusts)

9 April - LABOMAR

Maria Ozilea Menezes (LABOMAR), Marcelo de Oliveira Soares (LABOMAR), Samuel Façanha (LABOMAR), Carlos Teixeira (LABOMAR), Guilherme Lessa (LABOMAR), Revilino Martins (LABOMAR), Cristopher Reddy (Woods Hole, MA), Ryan Rodgers (Florida State University))

Moderator: Gabrielle Fernandes (LABOMAR)



30 April - Mission Atlantic

Saskia Otto (Universitat Hamburg), Sergio Floeter (Federal University of Santa Catarina), Roland Proud (University of St Andrews), David Reid (Marine Institute)

Moderator: Patrizio Mariani (Institut for Akvatiske Ressourcer – DTU Aqua)



7 May - Claire Jolly (OECD)

OECD on Ocean Economy Measurement

Moderator: Conceição Santos (DGPM)



14 May - Alfred NG (CSA) and Luis Gomes (AAC CLYDE SPACE)

Canadian CubeSat Project – Building Space Capacity in Canada; From Hardware to Services & Data: the changing focus of the space industry

Moderator: Anna Guerman (University of Beira Interior)



21 May - EU Marine Robots

H2020 project EU Marine Robotics Research Infrastructure Network (EUMR)



28 May - ASTRAL

Joanne Casserly (Marine Institute), Dominique Durand (NORCE), Patricia Erig Anyanwu (Nigerian Institute of Oceanography and Marine Research, Lagos), Bruna Guterres (FURG), Andreza Carvalho (UFC)

Moderator: Elisa Ravagnan (Nordic Centre of Excellence for Blue Bioeconomy SUREAQUA)





11 June - **Isa Elegbede (BTU)**

Blue economy: integrating approaches in seafood certifications through socio-ecological and technological inclusiveness

Moderator: Ife Okafor-Yarwood (University of St. Andrews)



18 June - **Space Generation Advisory Council (SGAC)**

Davide Petrillo (SGAC), Andrew Kurzrok (Amphenol Times Microwave Systems), Imane El Khantouti (University Grenoble Alpes), Alina Vizireanu (SGAC), Harlee Quizzagan (The Philippines of SGAC)

25 June - **UNICOSTA (Colombia)**

Alexis Sagastume (UNICOSTA), Ana Lucia Duarte (UNICOSTA)

Moderator: Marcos Silva (UNICOSTA)



9 July - **The All-Atlantic Pledging Campaign**

Moderator: Isabel Sousa Pinto (University of Porto)

16 de julho - **Thierry Chopin (University of New Brunswick)**

Integrated Multi-Trophic Aquaculture (IMTA): responsibly farming our waters by taking advantage of ecosystem services within a circular economy approach

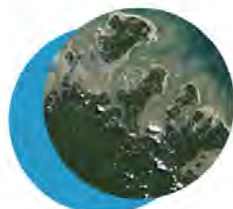
Moderator: Isabel Sousa Pinto (University of Porto)



23 and 30 July - **Coastal Observation and Modelling Systems in Brazil**

Andre Telles da Cunha Lima (BROIL), Carina Bock (Projeto Baía Viva), Paulo Nobre (BESM), Guilherme Franz (BSO), Julio Pellegrini (Costa Norte Project), Alexander Turra (ReBentos), Carlos Leandro (CRONOS project), Janini Pereira (REMO), Luiz Paulo Assad (LAMCE), Marcello Rollnic (UFP), Letícia Cotrim (BrOA), Luis H.P. Garbossa (SCTGN), Carlos A.E Garcia (SiMCosta), Janice Trotte-Duhá (Brazilian Navy)

Moderator: Segen Estefen (UFRJ)





8 October - Marine Biodiversity

Arturo Luna (Colombian Ministry of Science), Paula Sierra (INVEMAR), Juan A. Armando Sanchez (University of the Andes), Jaime Rojas (CEINER), Ellie Anne López Barrera

Moderator: *Luisa Villamil (Universidad de la Sabana in Colombia)*



12 November - Marine Biodiversity

Joana Soares (AIR Centre, MBON), Frank Muller Karger (MBON), Linwood Pendleton (Ocean Knowledge Action Network)

19 November - BIOCARIBE, Colombia
Jesus Olivero Verbel (University of Cartagena)





8. OTHER INITIATIVES – SPECIAL COMMITTEE ON OCEAN RESEARCH (SCOR), UNITED NATIONS ENVIRONMENT PROGRAMME (UNEP), UNITED NATIONS OFFICE FOR OUTER SPACE AFFAIRS (UNOOSA)

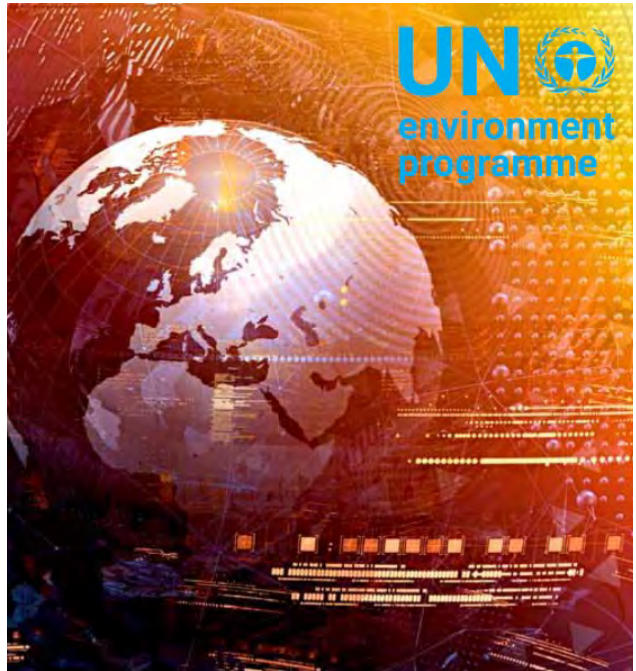
SCOR

The International Council for Science (ICSU) in 1957 formed a Special Committee for Ocean Research (SCOR) with the aim of promoting international cooperation for oceanographic research, with particular attention to interdisciplinary issues related to ocean processes and the development of oceanographic sciences in developing countries.

Portugal was a member of SCOR in 1992 and tried unsuccessfully to re-join in 1997. Recognizing the importance and potential of Portugal to have representation in the Committee with the scientific credibility of SCOR, which translates, among others, into the integration of Portuguese researchers, their work and their scientific contribution, in the major international oceanographic research programs, as well as the benefits that come from the infrastructure projects supported by SCOR, the AIR Centre, at the end of 2021, expressed its interest in becoming the institution representing Portugal as the new National Committee of SCOR, and received approval from that Committee.

On January 31st, 2022 a meeting took place with a view to the establishment of the National Committee of SCOR, which had a comprehensive and representative national participation, and an executive committee was appointed and the best practices, rights and duties of the National Committee were defined. SEE <https://scor-int.org/scor/committees/>

During the last quarter of 2021, the AIR Centre began preparing a Partnership Agreement to become a GRID partner of the United Nations Environment Programme (UNEP). This program is directly articulated with the UN Sustainable Development Goals (UN SDGs).



With this agreement, the AIR Centre aims to join a number of CRICKETs around the world, including centres in Switzerland, Kenya, and the United States of America. This network, which is called “UNEP GRIDs” processes large volumes of data and environmental variables that contribute to a Big Data platform that is visualized in a center which is called: World Environmental Situation Room. In this context, the AIR Centre will be part of a Global Environmental Data Strategy for Sustainable Development, Peace and Security and Humanitarian Action.

UNOOSA

Also during the last quarter of 2021, the AIR Centre sent a request to the United Nations to become a permanent observer member and Atlantic regional representative at the United Nations Office for Outer Space Affairs. This complementary link to another UN body strengthens the AIR Centre’s commitment to contribute to the achievement of the UN Sustainable Development Goals (UN SDGs) and further enhances all the activities that have been developed in the Space area with the AIR Centre’s unique Atlantic network.



9. FINANCIAL STATEMENTS 2021

9.1 ACCOUNTING REFERENCE FOR THE PREPARATION OF FINANCIAL STATEMENTS

As Demonstrações Financeiras foram elaboradas de acordo com o Sistema de Normalização Contabilística, aprovado pelo Decreto-Lei n.º 36-A/2011 de 9 de março que, com as alterações introduzidas pelo Decreto de Lei n.º 98/2015, de 2 de junho, que transpõe a Diretiva 2013/34/EU do parlamento Europeu e do Conselho, de 26 de junho de 2013.

As Demonstrações Financeiras foram preparadas, a partir dos registos contabilísticos da AD AIR Centre, de acordo com as NCRF - ESNL, no pressuposto da continuidade das operações.

9.2 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.

9.3 ANNEX TO ACCOUNTS

Associação AD AIR Centre

BALANCE SHEET STATEMENT

(Amount expressed in Euros)

	Notes	31/12/2021	31/12/2020
ASSETS:			
Non Current Assets:			
Fixed Assets	1	229 008,47	59 251,67
Other Financial Assets	2	12 962,14	6 364,22
		241 970,61	65 615,89
Current Assets:			
Customers		11 808,00	-
Deferrals	3	13 696,69	2 151,26
Other Current Assets			8 877,14
Cash and Bank Deposits		846 700,03	687 823,17
		872 204,72	698 851,57
Total Assets		1 114 175,33	764 467,46
EQUITY FUNDS:			
Retained Earnings	4	8 924,51	3 207,69
Equity Funds Adjustments	5	229 009,18	59 252,38
Net profit for the financial year		39 535,73	5 716,82
Total Equity Funds		277 469,42	68 176,89
LIABILITIES:			
CURRENT LIABILITIES:			
Suppliers		98 327,21	22 899,76
State and Other Public Entities	6	47 623,62	71 085,42
Financing obtained		3 842,61	-
Deferrals	3	511 281,94	266 486,35
Other financial liabilities	7	175 630,53	335 819,04
		836 705,91	696 290,57
Total Liabilities		836 705,91	696 290,57
Total Equity Funds and Liabilities		1 114 175,33	764 467,46

Associação AD AIR Centre

PROFIT AND LOSS ACCOUNT

(Amount expressed in Euros)

	Notes	31/12/2021	31/12/2020
Sales and Services Rendered	8	21 058,78	-
Operating Subsidies	9	1 766 620,84	1 526 324,64
Supplies and External Services	10	(576 596,01)	(494 242,99)
Staff Costs	11	(1 170 658,50)	(1 025 906,76)
Other Revenues and Gains	12	27 696,78	15 824,85
Other Expenses	13	(883,62)	(1 377,25)
Result before depreciations, financing costs and taxes		67 238,27	20 622,49
Expenses / (reversals) of depreciation and amortization	1	(27 696,78)	(14 905,67)
Operational result (before financing costs and taxes)		39 541,49	5 716,82
Interest and Similar Costs		(5,76)	-
Net income before taxes		39 535,73	5 716,82
Corporate taxes		-	-
Net income after taxes		39 535,73	5 716,82

Associação AD AIR Centre

Individual Statement of Changes in Equity - Financial year of 2021

(Amount expressed in Euros)

	Notes	Retained Earnings	Equity Funds Adjustments	Net Profit for the period	Total Equity
Financial position at the beginning of 2021	6	3 207,69	59 252,38	5 716,82	68 176,89
Changes in Period					
Changes in Accountig Policy			169 756,80		169 756,80
Other changes in Equity Funds		5 716,82		-5 716,82	0,00
	7	5 716,82	169 756,80	-5 716,82	169 756,80
Net Profit for the Period	8			39 535,73	39 535,73
Comprehensive Earnings	9 = 7 + 8			33 818,91	33 818,91
Financial position at the end of 2021	6+7+8	8 924,51	229 009,18	39 535,73	277 469,42

AD AIR Centre

CASH FLOW STATEMENT

(Amount expressed in Euros)

	31/12/2021	31/12/2020
<u>Operating Activities:</u>		
Receipts from trade debtors	42 622	-
Payments to trade creditors	(702 880)	(392 171)
Payments to employees	(929 573)	(730 451)
Cash flow generated by operations	(1 589 831)	(1 122 621)
Payments from income tax	-	(599)
Other receipts/payments	(279 195)	(233 988)
	(279 195)	(234 587)
Cash Flows from Operating Activities (1)	(1 869 026)	(1 357 208)
<u>Investing Activities</u>		
Receipts related to:		
Payments related to:		
Financial investments	(6 598)	(3 965)
Tangible Assets	(141 344)	(46 278)
Intangible Assets	-	-
	(147 942)	(50 244)
Cash Flows from Investing Activities (2)	(147 942)	(50 244)
<u>Financing Activities:</u>		
Receipts related to:		
Other financial Operation	2 176 538	1 859 754
	2 176 538	1 859 754
Payments related to:		
Interest and similar expenses	(693)	(1 180)
	(693)	(1 180)
Cash Flows from Financing Activities (3)	2 175 845	1 858 573
Changes in cash and cash equivalents (4) = (1) + (2) - (3)	158 877	451 121
Effect of exchange differences		
Cash and cash equivalent beginning of the period	687 823	236 702
Cash and cash equivalent at the end of the period	846 700	687 823

Annex to Financial Statements

NOTE 1 - Fixed Assets and Depreciations

Caption	31/12/2021	31/12/2020
Fixed Assets		
Basic Equipment	59 773,57	35 874,42
Administrative Equipment	53 313,32	45 499,15
Accrued Depreciations	(49 818,68)	(22 121,90)
Assets Under Construction	165 740,26	
Total	229 008,47	59 251,67
Depreciation and amortization	27 696,78	14 905,67

NOTE 2 - Other Financial Assets

Caption	31/12/2021	31/12/2020
Non Current Assets		
Financial participations - Geosat	100,00	-
Workers Compensation Fund (FCT)	12 862,14	6 364,22
Total	12 962,14	6 364,22

The company acquired a share of 100€ of the capital of Geosat.

The FCT are deliveries made to the Work Compensation Fund.

NOTE 3 - Deferrals

Caption	31/12/2021	31/12/2020
Assets		
Occupational Health	834,67	963,00
Insurance	12 862,02	-
IT Services		1 188,26
Total	13 696,69	2 151,26
Liabilities		
Income to be recognised	511 281,94	266 486,35
Total	511 281,94	266 486,35

Note 4 – Past Results

The carried forward income item comprises the accumulated net results of previous periods, including the application of the income for the past year, in the amount of EUR 5,716.82.

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

Note 5 - Adjustments to equity 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.

investimento a que respeitem.

NOTE 6 - State and Other Public Entities

Caption	31/12/2021	31/12/2020
Other Current Liabilities		
State and Other Public Entities		
IRS to be paid	14 576,62	30 339,56
IVA to be paid	10 396,94	6 914,67
Social Security	22 650,06	33 831,19
Total	47 623,62	71 085,42

NOTE 7 - Other Current Assets and Liabilities

Caption	31/12/2021	31/12/2020
Other Current Liabilities		
Wages and Salaries	154 295,33	143 988,18
Other Accrued Expenses	7 537,23	190 365,57
Other Creditors	13 797,97	1 465,29
Total	175 630,53	335 819,04

NOTE 8 - Services Rendered

Caption	31/12/2021	31/12/2020
1301 - HYPERS	22,16	-
1303 - ARI-ESA POSTS A3	1 736,14	-
1304 - ARI-ESA ENERGY A2	755,35	-
1305- PORT XXI ESA	18 545,13	-
Total	21 058,78	-

NOTE 9 - Operating Subsidiaries

Caption	31/12/2021	31/12/2020
Lisboa	1,00	-
FCT - geral	906 312,61	1 010 363,62
ESALAB - geral	193 477,37	378 925,73
CE2COAST	4 571,49	3 691,00
ALL ATLANTIC - 2021	6 000,02	-
EUREKA	214 816,75	-
MBON	119 867,96	81 500,75
RAEGE 2020	60 014,79	11 942,36
ASTRAL	103 464,19	16 172,25
ATLANTIC	4 184,14	2 608,63
LABPLAS	20 365,90	-
NEXTOCEAN	19 688,76	-
HYPERS	-	2 637,36
FPACUP	3 200,70	1 434,13
FPA CUP - 3,5 ATLANTIC	48 083,83	-
FPA CUP 3,2 Business INNOVATION	6 558,90	-
ARI-ESA POSTS A3	-	1 542,07
ARI-ESA ENERGY A2	-	2 272,41
PORT XXI ESA	-	6 524,93
ATON	5 062,65	-
MAGAL	32 976,24	125,09
INTAIRSECT	9 822,78	-
K2D	590,38	-
AEROS	22,61	-
SAP	4 292,56	-
ESDES	3 245,21	6 584,33
Total	1 766 620,84	1 526 324,66

NOTE 10 - Supplies and External Services

Caption	31/12/2021	31/12/2020
Scientific Consulting Services	75 180,36	110 258,27
Administrative Accounting and Tax Services	142 849,52	232 941,12
Advertising Services	150,00	906,53
Professional Fees	-	507,53
Tools	25 817,98	11 088,43
Energy and other fluids	578,11	
Travel Expenses	149 701,68	41 626,82
Communication	10 829,38	8 353,18
Conferences and other Events	143 097,94	69 728,94
Rents and Leasing	25 890,89	13 393,35
Other Supplies and Services	2 501,05	5 438,82
Total	576 596,91	494 242,99

NOTE 11 - Staff Costs

Caption	31/12/2021	31/12/2020
Management and staff Salaries	922 450,12	796 202,36
Reward	-	60 000,00
Social Security	199 371,33	149 409,92
Accidents at Work Insurance	24 125,86	9 070,55
Other Staff Costs	24 711,19	11 223,93
Total	1 170 658,50	1 025 906,76

NOTE 12 - Other Incomes

Caption	31/12/2021	31/12/2020
Exchange Differences		296,06
Allocation of Subsidies for Investment	27 696,78	14 905,67
Other Incomes		623,12
Total	27 696,78	15 824,85

NOTE 13 - Other Costs

Caption	31/12/2021	31/12/2020
Previous Exercises Corrections	1,00	
Exchange Differences	704,64	654,30
Fiscal Penalties	176,83	-
Other Costs	1,15	722,95
Total	883,62	1 377,25



9.4 INFORMATION REQUIRED BY LEGAL DIPLOMAS

Pursuant to article 21(1) of Decree-Law No. 411/91 of October 17, the AD AIR Centre Association confirms that it is not liable for any overdue contributions to Social Security and does not be liable for any amount due before the Tax Authority.

The Net Income calculated in 2021, in the amount of 39.535.73 euros, will be transferred to the item of Carried Forwarded Results.

The Statutory Auditor is the Sociedade Martins Pereira, João Careca e Associados, SRC, Lda. and, during 2021, earned 4.950 euros, plus VAT, as fees.



ANNEXES

ANNEXES	DESCRIPTION
1	Members of the General Assembly 2021
2	Members of the Board of Directors 2021
3	Composition of Human Resources 2021
4	Future prospects and subsequent events 2022
5	Portuguese Eureka Chairmanship Team
6	AIR Activities
7	Audit Report



ANNEX 1

Members of the General Assembly 2021

- Paulo Ferrão (President of the General Assembly)	Foundation for Science and Technology I.P.	Portugal
- Ana Quartin		
- Paulo Nascimento Cabral	Autonomous Region of the Azores	Portugal / Azores
- Guilherme Botelho Silva		
- Joaquín Hernandez Brito (Secretary of the General Assembly)	Plocan - Oceanic Platform of the Canary Islands	Spain
- Paula Pacheco		
- Asma Ibrahim	NASDRA - National Space Research and Development Agency	Nigeria
- Abayomi Oguntunde		
- James Loveder	BEIS - Department for Business, Energy & Industrial Strategy	United Kingdom
- Chris Matthews		
- Malik de Pina Duarte Lopes	Instituto do Mar	Cape Verde
- Clarissa Amaral	Secretaria do Meio Ambiente do Estado da Bahia	Brazil
- Bouchta El Mounni	Abdelamlek Essaadi University	Morocco
- Filomena Vaz Velho	Instituto Nacional de Investigação Pesqueira e Marinha (INIPM)	Angola
- (Awaiting designation)	Departamento de Ciência e Inovação (DSI) e SANSA	South Africa
- (Awaiting designation)	UNICOSTA	Colombia



ANNEX 2

Members of the Board of Directors 2021

- Maurício Guedes	Presidente	Brazil
- Miguel Belló Mora	CEO	Spain
- Carolina Rêgo Costa	Member	Portugal
- Salvador Landeros Ayala	Member	Mexico
- Nick Veck	Member	United Kingdom
- Sérgio Ávila	Member	Portugal
- Selby Modiba	Member	South Africa
- João Careca	ROC - Official Auditor (Martins Pereira, João Careca & Associados, SROC, Lda)	Portugal

ANNEX 3

Composition of Human Resources 2021

Miguel Belló Mora



Chief Executive Officer
(CEO)

Mariana Ávila



Project Developer, EO Lab

Stewart Bernard



Chief Science Officer (CSO)
Under a SANSA

Emanuel Castanho



Junior Project Engineer
Intern

Tânia Li Chen



Project Officer

Gabriel Costa



Administrative Assistant Intern

Valente Cuambe



Researcher in Space
Sciences

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

Leticia Leão



Administrative Intern

Rui Martins



Senior Project Officer, EO
Lab

Joaquim Melo



Junior Project Developer

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)

Natalia Ospina-Alvarez



Senior Project Officer and
Innovation Manager in Blue
Economy



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 2022

At the present time of the first half of 2022, the AD AIR Centre considers that the impact of national COVID-19 pandemic-related measures should be reduced by not putting the continuity of AD AIR Centre's operations in question, supported by the following commitments:

1. According to Council of Ministers Resolution (SPC) No. 29/2018, during 2022, the Foundation for Science and Technology (FCT) I.P., is committed to transferring an amount equivalent to 1,060M€;
2. In accordance with The Council of Ministers Resolution (SPC) No. 55/2019, during the year 2022 and under the ESA@Lab's activity plan, the Foundation for Science and Technology (FCT) I.P., is committed to transfer an amount equivalent to 600K€;
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 AD AIR Centre, has foreseen the commitment of programs, initiatives/events, projects in the context of the autonomous region of the Azores and the international network of the AIR Centre;

ANNEX 5

Portuguese Eureka Chairmanship Team



MIGUEL BELLO
MORA
Chair Person



ANA CRISTINA
NEVES
Deputy Chairwoman



PAULO FERRÃO
HLR



JOSÉ PAULO
ESPERANÇA
Deputy HLR



EMIR SIRAGE
NPC Chair



RITA SILVA
Deputy NPC Chair / NPC



POLINA PEREIRA
Deputy NPC



JOÃO FERREIRA
Deputy NPC



MARGARIDA
OLIVEIRA
Deputy NPC



JOÃO BENTES DE
JESUS
Strategic Advisor



LUÍS SILVESTRE
Communication Coordinator /
Press Manager



INÊS CORREIA
MESQUITA
Science Communication Officer



TERESA TAVARES
Science Advisor of the MCTES



ANDREA CUNTZ
Events Manager



ALEXANDRA
FRAZÃO
Executive Secretary



GEISA ROSA
Administrative and Finance
Manager



AURORA
FERNANDA
BAPTISTA
Finance Expert



ANNEX 6

AIR Activities



AIR CENTRE
ATLANTIC INTERNATIONAL RESEARCH CENTRE

Tom Coe on Unsplash

ATLANTIC INTERNATIONAL RESEARCH CENTRE (AIR CENTRE)

AN OVERVIEW OF THE HISTORY, NETWORK AND ACTIVITIES

GENERAL ASSEMBLY

- Paulo Ferrão (President of the General Assembly)	Foundation for Science and Technology I.P.	Portugal
- Ana Quartin		
- Paulo Nascimento Cabral - Guilherme Botelho Silva	Autonomous Region of the Azores	Portugal / Azores
- Joaquín Hernandez Brito (Secretary of the General Assembly)	Plocan – Oceanic Platform of the Canary Islands	Spain
- Paula Pacheco		
- Asma Ibrahim - Abayomi Oguntunde	NASDRA – National Space Research and Development Agency	Nigeria
- James Loveder - Chris Matthews	BEIS- Department for Business, Energy & Industrial Strategy	United Kingdom
- Malik de Pina Duarte Lopes	Instituto do Mar	Cape Verde
- Clarissa Amaral	Secretaria do Meio Ambiente do Estado da Bahia	Brazil
- Bouchta El Moumni	Abdelamlek Essaadi University	Morocco
- Filomena Vaz Velho	Instituto Nacional de Investigação Pesqueira e Marinha (INIPM)	Angola
- (Awaiting designation)	Department of Science and Innovation (DSI) and SANSA	South Africa
- (Awaiting designation)	UNICOSTA	Colombia

BOARD OF DIRECTORS

- Maurício Guedes	President of the Board of Directors*	Brazil
- Miguel Belló Mora	Chief Executive Officer*	Spain
- Carolina Rêgo Costa	Legal Adviser*	Portugal
- Salvador Landeros Ayala	Member	Mexico
- Nick Veck	Member	United Kindgom
- Sérgio Ávila	Member	Portugal
- Selby Modiba	Member	South Africa

* Members of the Board of Directors

OFFICIAL STATUTORY AUDITOR

- João Careca	ROC
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TABLE OF CONTENTS

HISTORICAL DEVELOPMENT OVERVIEW (2016-2021)	5
BRIEF NOTES ON THE AIR CENTRE NETWORK AND ACTIVITIES.....	13
1. GEOGRAPHY OF THE AIR CENTRE NETWORK	18
<i>South Africa</i>	19
<i>Namibia</i>	20
<i>Angola</i>	21
<i>São Tomé and Príncipe</i>	22
<i>Nigeria</i>	23
<i>Ghana</i>	24
<i>Benin</i>	25
<i>Cabo Verde</i>	26
<i>Morocco</i>	27
<i>Spain</i>	28
<i>Portugal</i>	29
<i>United Kingdom</i>	30
<i>Norway</i>	31
<i>United States of America</i>	32
<i>Colombia</i>	34
<i>Dominican Republic</i>	35
<i>Brazil</i>	36
<i>Mexico</i>	38
<i>Senegal</i>	38
<i>Cote d'Ivoire</i>	38
<i>Peru</i>	38
2. ADDITIONAL KEY PARTNERSHIPS	39
3. NETWORKING ACTIVITIES	44



AIR CENTRE

HISTORICAL DEVELOPMENT OVERVIEW (2016-2021)

The AIR Centre is the result of a systematic, stepwise process of scientific diplomacy initiated on June 10, 2016, in New York City, at the Institute of International Education (IIE). Its successful realization prompted many other scientific and policy workshops around the world under the title “Atlantic Interactions” including the installment of various “High-Level Industry-Science-Government Dialogue on Atlantic Interactions”.

The 1st High-Level Industry-Science-Government Dialogue on Atlantic Interactions, held in Terceira, Azores, Portugal, on April 20-21, 2017, suggested a clear alignment with the UN Sustainable Development Goals (SDGs). Specifically, the meeting outlined a white paper that recognized the need to foster interdisciplinary research and innovation through international cooperation, and drafted a science and technology agenda integrating space, climate, ocean, energy and data as central themes for the better understanding of the Atlantic Ocean.



AIR CENTRE



Fig. 1 - 1st High-Level Dialogue in the Azores, Portugal

The 2nd High-level Industry-Science-Government Dialogue on Atlantic Interactions, held in Florianopolis, Brazil, on November 20-21, 2017, proposed the formal establishment of the AIR Centre as a framework for scientific and technology collaboration and development of ideas, policies, research programs and projects concerning global challenges and local priorities in the Atlantic Ocean.

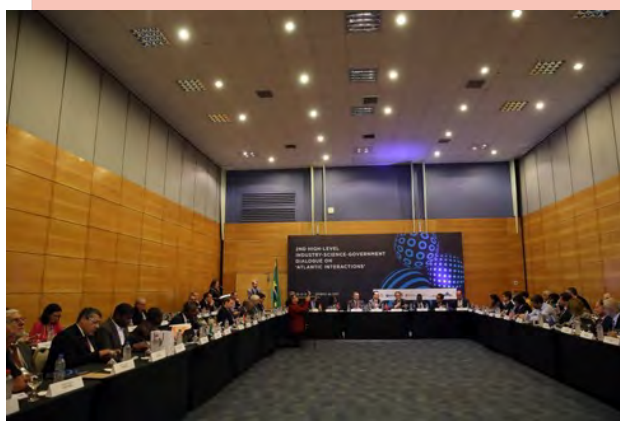


Fig. 2 - 2nd High-Level Dialogue in Florianopolis, Brazil

In the meantime, a number of highly relevant political statements were decisive in the establishment of the AIR Centre, namely the Belem Statement, signed by the European Commission, Brazil and South Africa, as well as the South-to-South Framework for Scientific and Technical Cooperation, signed by Brazil and South Africa.

The 3rd High-level Industry-Science-Government Dialogue on Atlantic Interactions, held in Praia, Cabo Verde, on May 7-8, 2018, underscored the progress in establishing the AIR Centre. Particularly worth mentioning are the preliminary identification of the flagship projects, and the first outline of the scientific program with six lines of action:



- Marine resources and biodiversity



- Healthy and clean oceans



- Systems integration from deep ocean to outer space



- Mitigation and adaptation to climate change



- Sustainable energy systems



- Data science



AIR CENTRE

Considering the initial commitments expressed in the Azores, Florianopolis and Praia, the Association for the Development of the AIR Centre (AD AIR Centre) was legally formed in April of 2018 as a non-profit association with headquarters in Terceira, Azores, Portugal. The Portuguese Science and Technology Foundation (FCT) granted initial pluriannual funding for 2018-2023, and the AIR Centre was established as an internationally distributed organization, working in close partnership with governments, academia, industry and civil society along and across the Atlantic Ocean.



Fig 3 – 3rd High-Level Dialogue in Praia, Cabo Verde



Figure 4 – 4th High-Level Dialogue in Canary Islands, Spain

A thorough work plan of supporting activities in close cooperation with relevant stakeholders was discussed and approved during the 4th High-level Industry-Science-Government Dialogue on Atlantic Interactions, on the Canary Islands in November of 2018. This work plan included:

-  Developing knowledge transfer and capacity building programs;
-  Mapping networks of scientific infrastructures and research organizations to promote shared access to all relevant stakeholders in the Atlantic region;
-  Identifying existing and/or planned local or national projects and initiatives aligned with the thematic missions that could be expanded to other regions;
-  Identifying and developing funding sources together with national or multinational funding agencies and multilateral organizations;
-  Disseminating scientific knowledge to the public, policy makers and media;
-  Developing innovative business ecosystems to foster new space and blue economies.



AIR CENTRE

The 5th High-level Industry-Science-Government Dialogue on Atlantic Interactions, on the Victoria Islands in Lagos, Nigeria, in April of 2019, acknowledged the development of the organization and central management structure of AIR Centre Headquarters in Portugal in close international cooperation with a network of scientists and research institutions. In addition, the meeting encouraged the roll-out of several AIR Centre hubs in different countries and regions.



Figure 1 – 5th High-Level Dialogue in Lagos, Nigeria



Figure 2 – Inauguration of an AIR Centre Hub, Rio de Janeiro

During this meeting several organizations signed a Letter of Intent for a Joint Framework to Promote Innovation, Entrepreneurship and Capacity Building in the New Space Sector through the deployment of a nanosatellite constellation. This innovation is meant to provide better Earth Observation services and products for Climate Action and the Blue Economy.



AIR CENTRE

By June 2019, additional funding was granted by FCT for the AIR Centre to install an Earth Observation Laboratory in Terceira, Azores, in close cooperation with the European Space Agency (ESA).

The 6th High-level Industry-Science-Government Dialogue on Atlantic Interactions and the All-Atlantic Summit on Innovation for Sustainable Marine Development and The Blue Economy: Fostering Economic Recovery in a Post-Pandemic World were held on October 5-9, 2020. This all-virtual five-day event was co-organized with Penn State's Alliance for Education, Science, Engineering and Design with Africa (AESEDA) and the AIR Centre. It brought together high-level representation from associate members of the AIR Centre, a diverse international scientific research community and industry partners to discuss ideas, initiatives and projects around AIR Centre's thematic missions as well as supporting cross-cutting activities such as capacity building, infrastructure sharing and Space/Ocean literacy.

All-Atlantic Summit

Online Summit • Free Registration
October 5-9, 2020 • Philadelphia, PA

allatlanticsummit2020.org



PennState





AIR CENTRE

Recognizing the growing interest in participating in the network, Portugal (November 2017), Spain (November 2018), Nigeria (February 2019), UK (July 2019), Cabo Verde (July 2019), the Government of the State of Bahia, Brazil, (March 2021), South Africa, Angola, Morocco (all in October 2021), and Colombia (November 2021) formally joined the Association for the Development of the AIR Centre (AD AIR Centre) as Associate Members. The Dominican Republic, Peru and Benin have also expressed their intention to formally join the AD AIR Centre in the next few months. Additional countries are engaged with the AIR Centre through its programs. Collectively these countries represent a substantial fraction of the Atlantic region.



The next AIR Centre High-level Industry-Science-Government Dialogue on Atlantic Interactions: From Science and Technology Development to Social Innovation and Climate Action will be held in Cape Town, South Africa, on March 14-18, 2022. The hybrid five-day event is co-organized with the Department of Science of Innovation of the Government of South Africa (DSI) and the South African National Space Agency (SANSA). It will bring together again high-level representatives, academia, industry and civil society to discuss the effects of climate change and biodiversity loss as well as to explore innovative solutions to prevent, adapt or mitigate its negative impacts on the environment and livelihoods.



AIR CENTRE

BRIEF NOTES ON THE AIR CENTRE NETWORK AND ACTIVITIES

The **Atlantic International Research Centre (AIR Centre)** is an international collaborative organization, oriented to foster knowledge-driven sustainable economic development in the Atlantic region. It addresses and integrates ocean, climate, space, energy, and data sciences and promotes cooperation to address national and regional priorities and global challenges such as those defined by the UN 2030 Agenda for Sustainable Development, the Paris Agreement, the Sendai Framework for Disaster Risk Reduction, the Decade of Ocean Science for Sustainable Development (2021-2030), the UN Decade on Ecosystem Restoration, and the All-Atlantic Ocean Atlantic Research Alliance, under the Galway and Belem Statements.



AIR CENTRE

The AIR Centre is all about advancing science and technology on a transformative scale in the Atlantic region. It builds on and expands the abilities of individual organizations, and it advances selected scientific and technological domains and their key actors towards shared targets. For that, it recruits and coordinates a complex web of organizations and individuals to deliver change and social impact through concrete actions.



Damir Babacic on Unsplash

This complexity stems from the AIR Centre's unique multidimensional mission-oriented, demand-driven, and problem-solving approach. Under the AIR Centre umbrella several sciences (i.e., ocean, climate, space, energy, and data sciences), different stakeholders (e.g., government, academia, industry, and civil society), and diverse geographies, cultures and affinities for technology (e.g., American, African, European countries and small island states or overseas territories in the Atlantic region) find a platform for dialogue and collaboration.



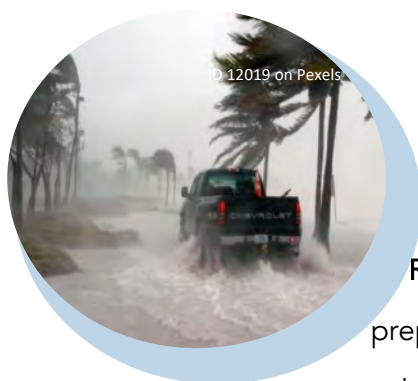
AIR CENTRE

THE FIVE MAIN THEMATIC MISSIONS OF AIR CENTRE ARE



Curioso on Unsplash

Clean and Productive Coasts, Bays and Estuaries – promoting the sustainable development of major coastal, bay and estuarine areas, with focus on reconciling urban growth and environmental preservation and restoration;



D 12019 on Pexels

Resilience to coastal hazards – preventing, reducing and increasing preparedness for response against coastal hazard exposure and vulnerability to natural or man-made disasters, such as floods, sea-level rise, and extreme weather, as well as adapting and mitigating climate change effects;



Isabella Kronemberger on Unsplash

Sustainable food production – promoting new food value chains with sustainable fisheries and off-shore aquaculture and reducing environmental risks and pressures for food security;



AIR CENTRE



Improved resource management of oceans, coasts and marine systems – promoting the sustainable development of ocean and coastal ecosystems, enhancing capacity for good governance of marine and coastal biodiversity, and raising awareness for local communities and decision makers on the economic value of the marine and coastal ecosystems and biodiversity;



Environmental and maritime monitoring – enabling the creation of impactful, affordable data collection and information systems employing collaboratively developed nanosatellites, robotics, and autonomous systems coupled with earth observation, models and artificial intelligence systems.



AIR CENTRE

In the context of these areas, the AIR Centre functions as a convener – a long-term consultation and dialog infrastructure, that enables governments, academia, and industry to work together with civil society to co-create solutions to cross-sectorial, transnational, interdependent problems. It is also a natural extension of individual organizations that makes it easier to find and engage new partners and key stakeholders. Most importantly, the AIR Centre promotes compelling narratives that bring people together to advocate for the environment and maximize societal impact.

Given the growing interest in the network, Portugal (November 2017), Spain (November 2018), Nigeria (February 2019), UK (July 2019), Cabo Verde (July 2019), the Government of the State of Bahia, Brazil, (March 2021), South Africa, Angola, Morocco (all in October 2021), and lately Colombia (November 2021) formally joined as Associate Members of the Association for the Development of the AIR Centre (AD AIR Centre), which is a non-profit association, incorporated in the Azores, under Portuguese laws, on April of 2018. The Dominican Republic, Peru and Benin have also expressed their intention to be formally associated to the AD AIR Centre in the next few months. Additional countries are engaged with the AIR Centre through its programs and these activities are included below. Collectively these countries represent a substantial fraction of the Atlantic region.



1.GEOGRAPHY OF THE AIR CENTRE NETWORK





SOUTH AFRICA



has been very supportive of the AIR Centre since day one, but only very recently became a formal associate member. The Department of Science and Innovation (DSI) promotes and the South African National Space Agency (SANSA) coordinates, with the support from the Council for Scientific and Industrial Research (CSIR), an emerging national hub of relevant institutions, which also includes the Department of Forestry, Fisheries and the Environment (DFFE), South African National Biodiversity Institute's (SANBI), South African Earth Observation Network (SAEON), South African National Antarctic Programme (SANAP), Nelson Mandela University (NMU), and the University of Cape Town (UCT), among others. This hub will focus on promoting Earth Observation as an enabler for sustainable development, promoting ocean and space research, building capacity, and fostering partnerships in the Atlantic region, namely within the African continent. DSI is also specially interested in aligning AIR Centre's agenda with the All-Atlantic Ocean Research Alliance and the Group on Earth Observations (GEO) to generate new synergies and leverage existing or planned projects, research infrastructures, and funding opportunities.



NAMIBIA



started to be active in the AIR Centre Network at the end of 2018. In February of 2019, the Ministry of Higher Education, Technology and Innovation (MHETI) organized a workshop with key institutions, such as the Ministry of Fisheries and Marine Resources (MFMR), the National Commission on Research, Science and Technology (NCRST), the Namibia University of Science and Technology (NUST), and the Namibian Maritime Fisheries Institute (NAMFI). During this workshop, the Sam Nujoma Marine and Coastal Resources Research Centre (SANUMARC), a multidisciplinary research center of the University of Namibia (UNAM), based in Henties Bay, was chosen to be the national coordinator, focusing on sustainable management of marine and coastal resources, preservation of indigenous knowledge and application of ocean and space science in response to major national developmental priorities.



ANGOLA



is an associate member strongly committed to the AIR Centre agenda. In April of 2019, the Ministry of Higher Education, Science, Technology and Innovation organized a workshop to mobilize a large number of local research institutions and establish an action plan for their participation in the AIR Centre Network. Several organisations contributed, including the Botanic Center of the Faculty of Sciences at the Agostinho Neto University (UAN), the National Space Program Management Office (GGPEN), the Academy of Fishery and Marine Sciences at the University of Namibe (UNINBE), Angola Cables, National Meteorology and Geophysics Institute (INAMET), Tundavala Polytechnic Institute, the Laboratory of Isotopic Hydrology of the National Technological Center (CTN) and the Instrumentation and Measurement Laboratory (LIM) of the Faculty of Engineering at UAN. It was then agreed that the national hub would be coordinated by the National Institute for Fisheries and Marine Research (INIPM) and the action plan should focus on strengthening national marine infrastructures, such as the Baía Farta oceanographic vessel, in addition to monitoring and preventing marine litter leakages to the ocean and mapping, preserving and restoring mangrove forests.



João Ferreira on Unsplash

SÃO TOMÉ AND PRÍNCIPE



Where the Ministry of Education and Higher Education (MEES) gathered several institutions with the aim to strengthen national capabilities for the use of Earth Observations to track vector-borne diseases and forecast their outbreaks, reduce and prevent deforestation and manage artisanal fisheries. These institutions are the University of São Tomé and Príncipe (USTP), the Ministry of Public Works, Infrastructure, Natural Resources & Environment (MOPIRNA), Ministry of Health (MS), Ministry of Agriculture, Fisheries and Rural Development (MAPDR), Ministry of Planning, Finance, and Blue Economy (MPFEA), the National Institute for Endemic Diseases (CNE) and the National Port Authority (ENAPORT).



NIGERIA



was the very first country to set up a national hub, which was promoted by the Federal Ministry of Science and Technology (FMST) and that is currently coordinated by the National Space Research and Development Agency (NASRDA). This hub includes parastatals, research institutions and universities such as the Federal Institute of Industrial Research, Oshodi (FIRO), the National Agency for Science and Engineering Infrastructure (NASENI), the Nigerian Hydrological Services Agency (NIHSA), the Nigerian Natural Medicine Development Agency (NNMDA), the Nigerian Institute for Oceanography and Marine Research (NIOMR) and the Federal University of Technology Minna (FUTMINNA). NIOMR and FUTMINNA are very active in the AIR Centre network, and lead national working groups on sustainable aquaculture, IUU fishing, development of low-cost flood early warning systems, and mitigation and adaption to climate change.



GHANA



is important for the AIR Centre not only because of the engagement with relevant national research institutions, but also as an entry point to other countries in West Africa. In fact, the Regional Marine Center (RMC) of the University of Ghana included the AIR Centre as an associated organization of the 2nd phase of the GMES & Africa program, which offers EO maritime and environmental monitoring services to 12 countries (Benin, Cabo Verde, Ivory Coast, Gambia, Ghana, Guinea, Guinea Bissau, Liberia, Nigeria, Senegal, Sierra Leone and Togo). The national hub includes the Centre for Remote Sensing and Geographic Information Services (CERSGIS), the Ghanaian Statistical Service, the D:Lab at Ashesi University, and the Space Systems Technology Lab of the All-Nations University College, which is responsible for the technical development and operation of the GhanaSat program.



BENIN



recently expressed its interest in joining the AIR Centre. The first step was the signing of a Memorandum of Understanding (MoU) with the Benin Institute for Halieutic and Oceanographic Research to (IRHOB) to explore potential collaboration in a large number of scientific domains, including: numerical modeling of coastal and marine circulation; monitoring of physical, chemical and biological properties of the ocean and coasts; stock assessment for fishery management; and evidence-based management of marine protected areas (MPAs).



CABO VERDE



is a very proactive Associate Member, constantly participating in programs related mainly to marine biodiversity and the Blue Economy. The Institute of the Sea (IMAR) coordinates and support all activities in the country that frequently include other actors, such as the University of Cabo Verde (UniCV), the Technical University of the Atlantic (UTA), and the National Port Authority (ENAPOR), and Maritime and Port Institute of Cabo Verde (IMP).



MOROCCO



formally only joined the AIR Centre very recently. Currently, it is in the process of consolidating the national hub, to be led by the University Abdelmalek Essaadi (UAE). Other institutions such as the National Institute for Halieutic Research, Casablanca Regional Center (INRH Casablanca) and the Chouaib Doukkali University (UCD) will also be part of the hub. The focus areas are the sustainable management of marine resources and the use of Earth Observation for monitoring coastal hazards.



SPAIN



The Government of Spain has designated the Oceanic Platform of the Canary Islands (PLOCAN) as their representative in the AD AIR Centre since they became an Associate Member in 2018. Diverse Spanish institutions have engaged with the AIR Centre, including the Superior Council for Scientific Research (CSIC), the Barcelona Supercomputing Center (BSC), the Center for Energy, Environment and Technology (CIEMAT), the Center for the Development of Industrial Technology (CDTI), and the Spanish Institute of Oceanography (IEO). High performance computing, artificial intelligence, marine robotics, marine aquaculture, offshore renewable energies, and biodiversity are the areas that have been most explored.



PORTUGAL



hosts the AIR Centre headquarters and other infrastructures, such as the EO Lab, in the Azores. The AIR Centre works literally with all agencies, research institutions and infrastructures in the country, including the University of Azores (UAC), the Atlantic Observatory, the Institute of Science and Innovation for Bio-Sustainability (IB-S) at the University of Minho (UMinho), The Minho Advanced Computer Center (MACC), CoLAB + Atlantic, Interdisciplinary Centre of Marine and Environmental Research (CIIMAR), the Underwater Systems and Technologies Laboratory (LSTS) at the Faculty of Engineering of the University of Porto (FEUP), the Institute for Systems and Computer Engineering, Technology and Science (INESC TEC), the Portuguese Hydrographic Institute, the Institute for Systems and Robotics (ISR) at the Instituto Superior Técnico (IST), Fórum Oceano, University of Lisbon (ULisboa), the Portuguese Space Agency (PT Space), and the Portuguese Institute for Sea and Atmosphere (IPMA). This large national hub encompasses all five thematic mission areas of the AIR Centre.



UNITED KINGDOM



The Government of the United Kingdom chosen the Satellite Application Catapult to coordinate the national hub that is primarily focused on the development of EO services and products. The AIR center has also promoted the use of remote sensing of marine litter with the Plymouth Marine Laboratory (PML) and the development of sensors for in-situ observations with the National Oceanography Centre (NOC).



NORWAY



The Minister of Research and Higher Education of Norway endorsed two of the most recent AIR Centre Declarations (Canary Islands and Lagos) and the AIR Centre also signed a MoU with the Norwegian University of Science and Technology (NTNU) to discuss and analyze the feasibility of the deployment of a constellation of CubeSats. Further discussions are under way to engage more research institutions and to consider a common agenda for collaboration with other Atlantic countries.



UNITED STATES OF AMERICA



The engagement with the United States of America is predominantly made through universities and individual researchers. The Alliance for Education, Science, Engineering and Development in Africa (AESEDA) of the College of Earth and Mineral Science at Pennsylvania State University (Penn State) signed a MoU to improve partnership, cooperation, and coordination with respect to education, training, and research in topics related to the Atlantic at large. The AIR Center is part of the Global Science and Technology Partnerships (GoPortugal) initiative, which supports the MIT-Portugal, Carnegie Mellon Portugal and UT Austin Portugal programs. Examples of current projects are: MAGAL Constellation project, with UT Austin, which will build 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; the AEROS project, with MIT, aimed to develop and launch into orbit a new nanosatellite platform as a precursor to a future constellation that can harness the great potential of the study of the Earth, its oceans and atmosphere in liaison with advanced communications technologies; and

the K2D project with MIT that proposes the development of a global and disruptive monitoring system for oceans, able to tackle all depths, from the deep sea bottoms and abyssal platforms to the surface. K2D will develop a synergistic set of components that allows the cost-effective gathering of extensive and complete data from the oceans. For that purpose, acoustic information and environmental DNA will be combined, as well as advanced Geoinformatics Modeling combined with Artificial Intelligence tools to enrich geospatial and temporal information models to describe and anticipate oceans health patterns and human activities.



COLOMBIA



formally represented by the Ministry of Science of Technology (MINCIENCIAS), is AIR Centre's most recent associate member. MINCIENCIAS will coordinate the national hub, which will include the University of the Coast (UNICOSTA), the University of Cartagena (UNICartagena), the University of Antioquia (UdeA) and other research institutions to be added soon. The initial focus is the implementation of the National Bioeconomy Mission, launched in December of 2020, which is the country's first mission-oriented research policy. The main goal is to promote the socioeconomic development of the country throughout all regions by efficient and sustainable management of biodiversity. UNICOSTA led the creation of the AIR Centre Caribbean with the participation of the Dominican Republic Ministry of Higher Education, Science and Technology (MESCyT), the University of Quintana Roo (UQRoo), Mexico, and the Federal University of Western Pará (UFOPA), Brazil.



DOMINICAN REPUBLIC



The Dominican Republic is close to becoming an Associate Member. The Ministry will coordinate the creation of a national hub that will include the Center for Marine Biology (CIBIMA) at the Autonomous University of Santo Domingo (UASD), the Technological Institute of Santo Domingo (INTEC), and the Frederico Henriques y Carvajal University (UFHEC). The hub will essentially cover the preservation and restoration of marine biodiversity and ecosystems, sustainable tourism, and nanosatellite technologies for monitoring natural resources.

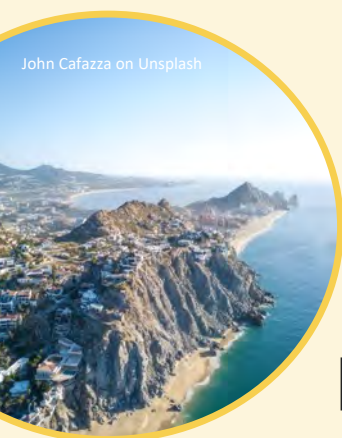


BRAZIL



The AIR Centre approach to Brazil focus on partnerships at state level that resulted in a very active hub of networks. The first hub was set up in the State of Ceará, which includes the State Secretary of Science, Technology and Higher Education, the Ceará State University (UECE) and the Marine Science Institute (LABOMAR) of the Federal University of Ceará (UFC). The main areas of interest are the Blue Economy, Marine Spatial Planning, marine pollution, and biodiversity of the Equatorial Atlantic. The hub in the State of Rio de Janeiro is hosted by the Laboratory of Computational Methods in Engineering (LAMCE), located at the Alberto Luiz Coimbra Institute for Graduate Studies and Research in Engineering (COPPE), at the Federal University of Rio de Janeiro (UFRJ). LAMCE is well known for its studies on ocean modelling, marine pollution, artificial intelligence, data visualization, and coastal processes. The Oswaldo Cruz Foundation (FIOCRUZ), is a key component of this hub, adding competences in public health and socioenvironmental vulnerability. The Government of the State of Bahia, as an Associate Member of the AIR Centre, designated the Geosciences Institute (IGEO) of the Federal University of Bahia (UFBA) to host the

hub, which has as main interest areas the blue economy, marine pollution, coastal processes, coastal biodiversity with emphasis on corals, seagrass and mangroves, and preservation and restoration of ecosystems and biodiversity. Based in the State of Pará, the Marine Environmental Monitoring Research Laboratory (LAPMAR) of the Institute of Geosciences (IG) at the Federal University of Para (UFPA) coordinates AIR Centre I Amazonia, an interstate hub that includes the Emilio Goeldi Museum (MPEG), famous for its biodiversity and anthropology collections, the Institute for Scientific and Technological Research of the State of Amapá (IEPA), the Federal University of Amapá (UNIFAP) and the State University of Amapá (UEPA). The main interest areas are wildfires, deforestation, marine pollution, coastal processes, coastal biodiversity, resilience of coastal communities, traditional fishing and aquaculture, and capacity building. The AIR Centre also signed collaboration agreements with the Brazilian National Institute for Space Research (INPE) and the INESC P&D Brazil, which is an association of more than 20 research universities.



MEXICO

(through the Mexican Space Agency – formal representation at the AIR Centre board of directors; AEM and the University of Quintana Roo - UQRoo).



SENEGAL

(Oceanographic Research Center of Dakar Thiaroye – CRODT)



COTE D'IVOIRE

(University Center for Research and Application in Remote Sensing – CURAT, of the Felix Houphouët-Boigny University – UFHB),



PERU

(National Council for Science, Technology and Technological Innovation – CONCYTEC, and the Peruvian Navy)



In different stages of formal association membership or participation in the AIR Centre Network, but conversations are progressing very quickly and will soon lead to formal agreements on the partnership. More countries are in initial stages of dialogue



AIR CENTRE

2. ADDITIONAL KEY PARTNERSHIPS

The AIR Centre hosts the secretariat of the Marine Biodiversity Observation Network (MBON), whose ultimate objective is to understand how and why ocean life is changing, how local changes relate to changes taking place over larger regions, and to provide information to help define options for government and intergovernmental policies relevant to the conservation and sustainable use of marine biodiversity. MBON plays a key role in the network of partners organizing the Marine Life 2030 Programme endorsed by the UN Decade of Ocean Science for Sustainable Development, jointly with the Global Ocean Observing System, the Ocean Biodiversity Information System, the Ocean Best Practices System, UNEP WCMC, the Ocean Knowledge Action Network, and the US Consortium for Ocean Leadership.





AIR CENTRE

The AIR Centre hosts the Sargassum Information Hub in close partnership with AtlantOS, GEO Blue Planet and IOCARIBE of IOC-UNESCO, which is an operational region-wide information and forecasting system for sargassum, which includes best management practices for sargassum events in the coastal environment. This system is based on publicly available data, such as satellite and in-situ data, from countries with open data sharing policies.

The AIR Centre has developed partnerships with several organizations such as the European Space Agency (ESA), Argans, INESC TEC, PML, UNEP, ICCG, to promote the development the use of Remote Sensing and Smart Technologies for Marine Litter.

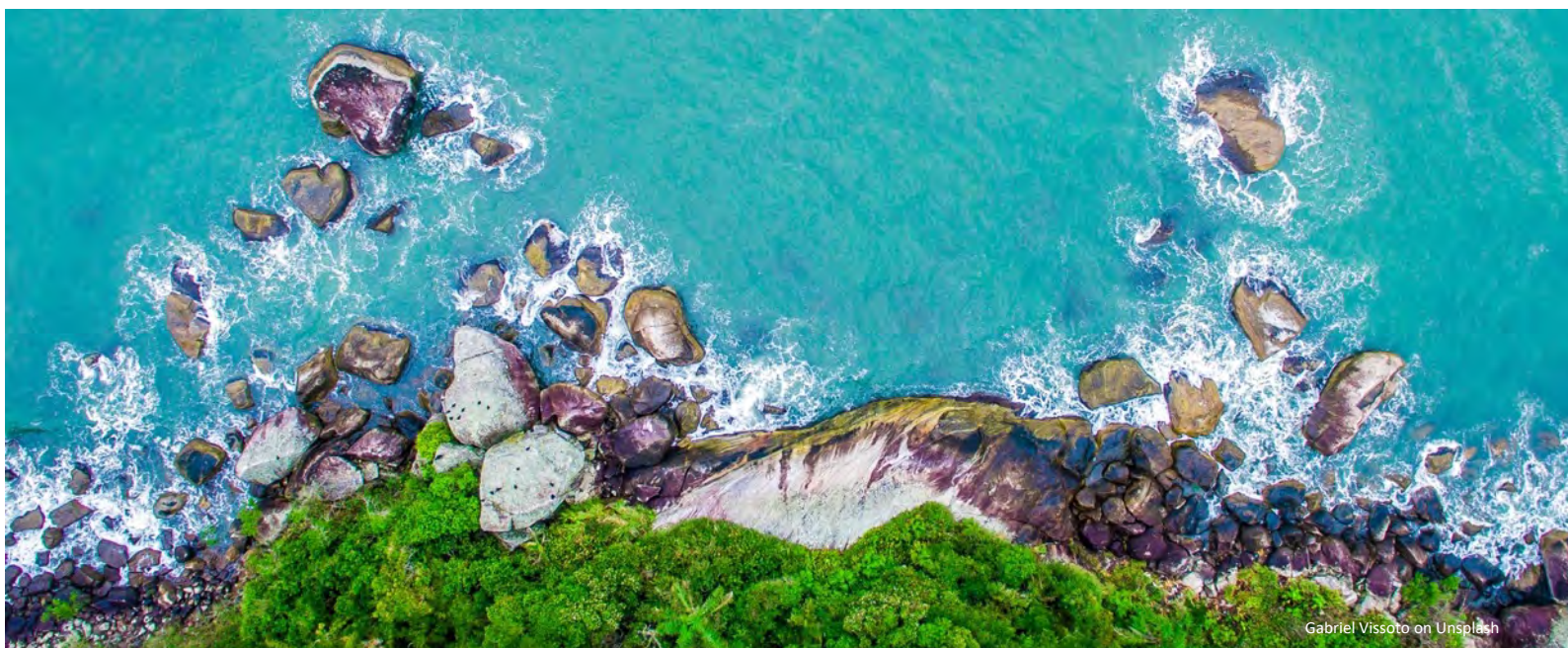
The AIR Centre has signed partnerships agreements with numerous international institutions or initiatives, such as the United Nations Office for Outer Space Affairs (UNOOSA), GEO Blue Planet, LifeWatch ERIC, and the International Space University (ISU), among several others.





AIR CENTRE

The AIR Centre and the Portuguese Foundation for Science and Technology (FCT) launched an International Scholarship Program to enhance the scientific research and technology development capabilities of the AIR Centre Network, to strengthen existing collaboration ties and explore or develop new collaboration opportunities and promote multilateral cooperation between Portuguese scientific institutions and other institutions from other Atlantic countries. So far, 27 PhD grants were awarded or are in the process of being awarded in the fields of Data Science, Health, Marine Robotics, Marine Litter, Numerical Modelling, Biodiversity, Ocean Accounting and Earth Observation. In total, the scholarship program will award 60 scholarships in three years.



The Fulbright Portugal Foundation, in cooperation with the AIR Centre, established the Fulbright Award in Space, Atmosphere, Ocean, Climate, Energy and Data Science/AIR Centre to promote academic mobility between the US and Portugal.



AIR CENTRE

The AIR Centre participates in two large project consortia, ASTRAL and MISSION ATLANTIC, supporting the All-Atlantic Ocean Research Alliance. ASTRAL's main goal is to increase value and sustainability for integrated multi-trophic aquaculture (IMTA) production by developing new, resilient, and profitable value chains. MISSION ATLANTIC aims to improve our understanding of Atlantic Ocean ecosystems and drivers of change that impact marine biodiversity and ocean resources, through the development of the Integrated Ecosystems Assessments (IEAs).

Still related to the All-Atlantic Ocean Research Alliance, the AIR Centre co-leads, together with IFREMER, the All-Atlantic Marine Research Infrastructure Network Joint Action (AA-MARINET). AA-MARINET is a multistakeholder network, which will provide tools to foster and support collaborative RI initiatives and promote Trans-National Access (TNA)/infrastructure sharing in the Atlantic region. It builds upon other initiatives, but it will be more than the sum of its parts since it will provide a long-term forum for sharing infrastructures in the Atlantic area. One case study, ship-time sharing, and three pilot actions, I/ITAPINA (pelagic imaging), AA-COASTNET (coastal in-situ observations) and Polar Research (connecting research institutions and researchers from both poles), are currently being implemented. The Joint Action will also develop a Web Portal for collaboration opportunities.



AIR CENTRE

Following the MoU signed with INPE, and the signing of the Letter of Intent for a Joint Framework to Promote Innovation, Entrepreneurship and Capacity Building in the New Space Sector through the Deployment of An All-Atlantic Nanosatellite Constellation during the 5th High-Level Level Dialogue held in Lagos, Nigeria, in April of 2019, the AIR Centre started to listen to potential stakeholders to explore the feasibility of deploying a collaborative Atlantic Nanosatellite Constellation. Several workshops on potential use cases were held and the constellation project is now in the technical specification phase.



Silas Balsch on Unsplash



AIR CENTRE

3. NETWORKING ACTIVITIES

The AIR Centre has organized hundreds of in-person, hybrid and virtual events to create long-term Webinar series, such as the Networking Fridays, that brought together thousands of people from 125 countries. The series includes a monthly focus on biodiversity themes and the integration of marine life observations with other essential ocean variables to benefit society in all the areas main addressed by the AIR Centre.

The next AIR Centre High-level Industry-Science-Government Dialogue on Atlantic Interactions: From Science and Technology Development to Social Innovation and Climate Action will be held in Cape Town, South Africa, between the 14th and 18th of March of 2022. This hybrid five-day event is co-organized with the Department of Science of Innovation of the Government of South Africa (DSI) and the South African National Space Agency (SANSA). It will once again bring together high-level representatives, academia, industry and civil society to discuss the effects of climate change and biodiversity loss in the Atlantic region as well as to explore innovative solutions to prevent, adapt or mitigate its negative impacts on the environment and livelihoods.



AIRCENTRE

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www.aircentre.org



ANNEX 7

Relatório de Auditoria



STATUTORY AUDITOR'S REPORT

(Free translation from a report originally issued in Portuguese language. In case of doubt the Portuguese version will always prevail)

REPORT ON THE AUDIT OF THE FINANCIAL STATEMENTS

Opinion

We have audited the accompanying financial statements of **AD AIR CENTRE – Associação para o Desenvolvimento do Atlantic International Research Centre (the Entity)**, which comprise the balance sheet as at 31st december 2021 (showing a total of 1.114.175 euros and a total net equity of 277.469 euros, including a net profit of 39.536 euros), the income statement by nature for the year then ended, and notes to the financial statements, including a summary of significant accounting policies.

In our opinion, the accompanying financial statements are prepared, in all material respects, in accordance with the Accounting Standard for Non Profit Entities adopted in Portugal under the Portuguese Accounting System.

Basis for opinion

We conducted our audit in accordance with International Standards on Auditing (ISAs) and further technical and ethical standards and guidelines as issued by Ordem dos Revisores Oficiais de Contas (the Portuguese Institute of Statutory Auditors). Our responsibilities under those standards are further described in the Auditor's Responsibilities for the Audit of the Financial Statements section below. We are independent of the Entity in accordance with the law and we have fulfilled other ethical requirements in accordance with the Ordem dos Revisores Oficiais de Contas code of ethics.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

Responsibilities of management body for the financial statements

Management is responsible for:

- the preparation of financial statements in accordance with the Accounting Standard for Non Profit Entities adopted in Portugal under the Portuguese Accounting System;
- the preparation of the management report in accordance with applicable laws and regulations;
- designing and maintaining an appropriate internal control system to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error;





- the adoption of accounting policies and principles appropriate in the circumstances; and
- assessing the Entity's ability to continue as a going concern, and disclosing, as applicable, the matters that may cast significant doubt about the Entity's ability to continue as a going concern.

Auditor's Responsibilities for the Audit of the Financial Statements

Our responsibility is to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with ISAs will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these financial statements.

As part of an audit in accordance with ISAs, we exercise professional judgment and maintain professional skepticism throughout the audit. We also:

- identify and assess the risks of material misstatement of the financial statements, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for our opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control;
- obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Entity's internal control;
- evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by management;
- conclude on the appropriateness of management's use of the going concern basis of accounting and, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the Entity's ability to continue as a going concern. If we conclude that a material uncertainty exists, we are required to draw attention in our auditor's report to the related disclosures in the financial statements or, if such disclosures are inadequate, to modify our opinion. Our conclusions are based on the audit evidence obtained up to the date of our auditor's report. However, future events or conditions may cause the Entity to cease to continue as a going concern;



- evaluate the overall presentation, structure and content of the financial statements, including the disclosures, in accordance with the Accounting Standard for Small Entities adopted in Portugal under the Portuguese Accounting System;
- communicate with those charged with governance, including the supervisory body, regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that we identify during our audit.

Our responsibility also includes the verification that the information contained in the management report is consistent with the financial statements.

REPORT ON OTHER LEGAL AND REGULATORY REQUIREMENTS

On the management report

In compliance with the applicable legal requirements, in our opinion the management report was prepared in accordance with the applicable legal and regulatory requirements in force and the information contained therein is consistent with the audited financial statements and, taking into consideration the knowledge and appreciation about the Entity, we have not identified any material misstatements.

Lisboa, 23rd march 2022

Martins Pereira, João Careca & Associados, SROC, Lda.

Society registered at OROC under n.º 68 and CMVM under n.º 20161404

represented by João António de Carvalho Careca

registered at OROC under n.º 849 and CMVM under n.º 20160473



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