

Towards a research agenda on Climate Change and Energy, Space and Oceans for the Atlantic

The Atlantic is still mostly understudied in terms of its natural resources, ecosystems dynamics and interdependences with human activities. It is also a territory that enables specific integrative capacity for Climate Change and Energy, Space and related Earth and Ocean interactions.

A better understanding of the Atlantic, for the sustainable management of this common resource, requires the alignment of research strategies through international cooperation.

The Azores Archipelago has several advantages that make it a privileged place for harboring a dedicated structure for an ambitious research agenda (*Azores International Research Center – AIR Center*) in the above areas. This Center would be strategically placed for Atlantic observation, enabling the deployment of research and monitoring platforms.

In this context, the Fundação para a Ciência e a Tecnologia (FCT) is promoting a series of workshops to define a new research agenda for the Atlantic, as detailed below.

WORKSHOP 1

New York City - USA, June 10th

GOAL

Launch a participatory discussion among a selected number of research leaders on Climate Change and Energy, Space and related Earth and Ocean sciences

WORKSHOP 2

Ponta Delgada - Azores, June 27th

GOAL

Consolidation of the discussion on the Atlantic centered research agenda on Climate Change and Energy, Space and Oceans

WORKSHOP 3

Lisbon, July 4th

GOAL

Presentation of the key scientific developments of the AIR Center, by Dr. Eric Lindstrom (NASA) and discussion of its international relevance on a roundtable of Ambassadors of Atlantic countries

WORKSHOP 4

ESA - Paris, August 29th

GOAL

Discussion of the role of the AIR Center in ESA activities

WORKSHOP 5

Brussels - Belgium, September 19th

GOAL

Presentation and discussion of the AIR Center research agenda with leading European stakeholders

FORTHCOMING WORKSHOPS

Brasil, November

UT Austin and MIT - USA, November

Portugal Ministerial visit to ESA HQ and Azores related Workshop

August 29th 2016 - European Space Agency (ESA) Headquarters

AGENDA

14:00 Round-table on Azores International Research (AIR) Center

CHAIRS Franco Ongaro, Director of Technical and Quality Management - ESA
Paulo Ferrão, President of FCT

AIR Center: concept paper

Paulo Ferrão, President of FCT

ESA Programmes and the AIR Center

Franco Ongaro, Director of Technical and Quality Management

Thomas Beck, Directorate of Operations

Udo Becker, General Support Technology Programme

Simonetta Cheli, Directorate of Earth Observation

Flaminia Rossi, Directorate of Launchers

Contributions from the Portuguese R&D and Industry stakeholders

CEIIA, Critical Software, Edisoft, Elecnor Deimos, Faculdade de Ciências of the Universidade de Lisboa, GMV, Omnidea, Tekever, Universidade de Coimbra - IPN, Universidade do Porto

Questions for round-table guests (3 questions for discussion)

- *How can the AIR Center contribute to foster ESA activities?*
- *Which products/services can industry and academia develop associated to the implementation of space transportation activities in the Azores?*
- *Which Earth Observation (EO) activities on Space and Oceans can be developed under the umbrella of the AIR Center during the next 5 years (2017-2022)?*

16:30 Rapporteurs of round-table

Piero Messina, Strategy Department - ESA

Paulo Ferrão, President of FCT

16:45 Final remarks

Fausto Brito e Abreu, Azores Regional Secretary for the Sea, Science and Technology, PT

Manuel Heitor, Minister for Science, Technology and Higher Education, PT

17:00 End of meeting

List of Participants

NAME	ORGANIZATION
Alberto de Pedro Crespo	GMV
Álvaro Peliz	Faculdade de Ciências of the Universidade de Lisboa
Bruno Carvalho	Critical Software
Carlos Pires	Deputy Chief of Mission, Portuguese Embassy in Paris
João Tasso	Universidade do Porto
Elsa Alexandrino	Elecnor Deimos
Fausto Brito e Abreu	Azores Regional Secretary for the Sea, Science and Technology, PT
Flaminia Rossi	Directorate of Launchers - ESA
Francisco Cunha	Tekever
Franco Ongaro	Director of Technical and Quality Management - ESA
Luís Serina	Head of FCT Space Programme
Manuel Heitor	Minister of Science, Technology and Higher Education, PT
Miguel Bélo Mora	Elecnor Deimos
Paulo Ferrão	FCT President
Paulo Guedes	Critical Software
Piero Messina	Strategy Department - ESA
Simonetta Cheli	Directorate of Earth Observation - ESA
Teresa Mendes	Universidade de Coimbra - IPN
Teresa Tavares	Adviser to the Minister of Science, Technology and Higher Education, PT
Thomas Beck	Directorate of Operations - ESA
Tiago Pardal	Omnidea
Tiago Rebelo	CEIIA
Tiago Sepúlveda	Edisoft
Udo Becker	General Support Technology Programme - ESA

Atlantic Interactions: Knowledge, Climate Change, Space, and Oceans a science agenda for Transatlantic Scientific and Technological Cooperation

Brief Background Note

The potential installation of an Azores International Research Center (AIR Center), based on existent infrastructures, namely the Air Base at Terceira island, the airfield in Santa Maria island, the Santa Maria S-band station at Terceira Island, the DOE-ARM facilities in Graciosa or the Department of Oceanography of the University of the Azores in Faial, is briefly discussed in this note.

The AIR Center, as an integrative and distributed research platform, could provide a shared and international environment to support and foster new climate, earth, space and marine research activities, benefiting decision makers, public users, universities and industry as well as contributing to retain highly skilled human resources and backing regional growth.

In particular, the AIR Center may provide a unique opportunity to drive multilateral cooperation in complex systems engineering and science through an integrative approach to climate and energy, earth, space, and ocean R&D in Atlantic.

Through a flexible international governance model with international statute and international legal personality (i.e., emulating from CERN experience, in Geneva, among others), this Center will surpass national constraints providing an adequate regulatory framework, such as staff regulations, financial contributions and definition of the several scientific programs.

Potential research infrastructures that can enable joint international collaboration

AIR Center to Implement ASORES (Action plan for Sustainability, Operational protection and Resilience of Earth and Space systems):

The ASORES stakeholders (C3P, FCT, FLAD, NASA and ESA) find Azores islands optimal Space analogue laboratories for developing scientific and technological projects. ASORES projects may include emergency and resilience against hazards, sustainable energy systems, new materials and greener manufacturing, monitoring human activities at sea, greener fuels, resilience of space Center or launcher's sites, and monitoring the environment.

Antenna for VLBI/SKA in São Miguel: AIR Center would receive the data center of the São Miguel large VLBI antenna. There is potential for the large antenna (32m) to become a strategic asset (location and antenna size) in the scope of the EVN (European network of infrastructures for Very Long Baseline Interferometry), subject to viability analysis of the infrastructure.

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Potential research infrastructures that can enable joint international collaboration

Space debris radar in Azores: The boom in commercial, governmental and military satellites is dramatically increasing the number of objects in orbit (active satellites and inactive debris), presently over 1 million objects. Azores can use its low air traffic flux and unique geographic location for hosting space surveillance and tracking radar and provide a continuous coverage over the Atlantic. The target radar (13m) is based in the USA HAX tracking radar operated by MIT LL. Cooperation with leading universities (e.g., MIT) is welcome for technology development and support development. HAX radar is similar in physical characteristics, performance and latitude.

Atlantic Spaceport: The airfields in Terceira and Santa Maria have all the adequate infrastructures and free air space to host a spaceport for low cost access to space, including launchers for mega constellations and micro satellites.

Lab-Horta@DOP & Cold Water Coral Lab: Deep sea ecosystem research related light infrastructures that allow the artificial creation of natural deep sea environment conditions, generating new research opportunities in the area of hydro-thermal activity, deep biosphere, marine biology and geology and oceanography.

ESA/NASA incubation Center for Atlantic cooperation: The ESA incubation model in place in many EU countries could have a spin-out model in Azores, attracting Private Capital from EU and USA (eventually implemented through a PPP model). Installation of a “startup campus” for “high risk, high reward” companies may be planned.

Host a COPERNICUS national IP site and in-situ data: In-situ data from sensors, floaters, vessels, atmospheric profiles, 3D ocean models, campaigns, can be hosted.