

Three steps 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 three international 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

INTERIM STEPS

1. Collect individual written contributions - **May 31st**
2. Rapporteurs summary and recommendations of each thematic sessions as a first input for the research agenda document – **June 10th**
3. Submission of final versions of individual written contributions to FCT (AIR.workshops@fct.pt) – **June 15th**

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

INTERIM STEPS

1. Preparation of a draft proposal of the research agenda to be distributed by FCT– **June 22nd**
2. Interdisciplinary working groups per thematic area to consolidate and agree on an Atlantic centered research agenda – **June 27th**
3. FCT will circulate the final version of the research agenda among all participants for approval – **July 17th**

WORKSHOP 3

Brussels – Belgium, September (date between 19-23)

GOAL

Presentation and discussion of the Atlantic centered research agenda with leading European stakeholders.

Atlantic Interactions: Climate Change and Energy, Space and Oceans

1ST WORKSHOP

DATE

June 10th, 2016

DURATION

1 day

VENUE

Institute for International
Education (IIE), New York City

TIME-TABLE

09:30am to 5:00pm

RECEPTION

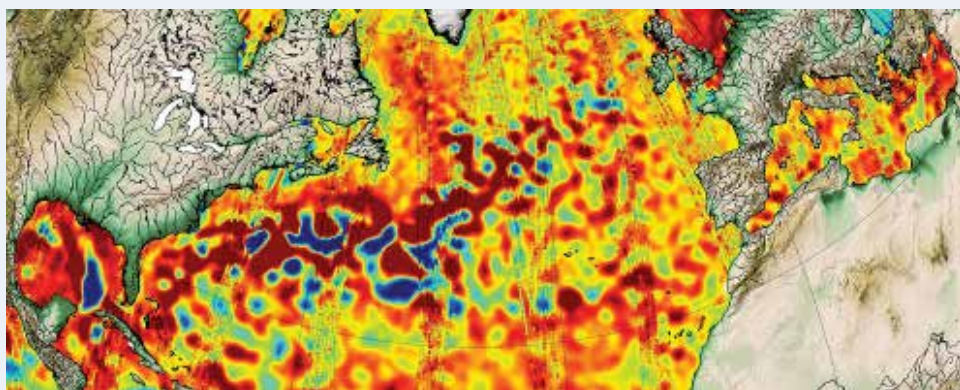
6:00pm to 8:00pm

PARTICIPANTS

Scientific community and
Institutional representatives.

FORMAT

Key-notes and Round table
discussions with moderators
and rapporteur(s)



DAY OF PORTUGAL

ORGANIZERS

Ministry for Science, Technology and Higher Education of Portugal

Permanent Mission of Portugal to the United Nations

Consulate-General of Portugal in New York

FCT - Fundação para a Ciência e a Tecnologia, Portugal

PAPS - Portuguese-American Postgraduate Society

1st Workshop

Agenda

08:45 REGISTRATION**09:00 WELCOME**

Allan E. Goodman, President and CEO - Institute for International Education, IIE, PT

Paulo Ferrão, President of the Fundação para a Ciência e a Tecnologia (FCT), PT

Manuela Bairos, Consul General - Portuguese Chancery in New York City, PT

Manuel Heitor, Minister for Science, Technology and Higher Education – Portuguese Government

9:20 KEY-NOTE**The uncovered potential of the Azores as an International Research Center (“AIR Center”)**

Eric Lindstrom, NASA, Co-chair of the International Global Ocean Observing System Steering Committee and Co-chair of the US Interagency Ocean Observations Committee (IOOC), USA

Pedro Conceição, United Nations Development Program, UNDP

10:00 Data Science and Energy Systems for the Atlantic**CO-CHAIRS** José Fonseca de Moura, Carnegie Mellon University, USA

Bruce Tidor, Massachusetts Institute of Technology, USA

PARTICIPANTS Juan Sanchez, University of Texas at Austin, USA

Manuela Veloso, Carnegie Mellon University, USA

Carlos Santos Silva, Instituto Superior Técnico – Universidade de Lisboa, PT

Scott Van Broekhoven, MIT Lincoln Lab, USA

Rui M. Ponte, Atmospheric and Environmental Research Inc., USA

Soumya Kar, Carnegie Mellon University, USA

Marija D. Ilic, Carnegie Mellon University, USA

11:30 Atmospheric Science and Climate Change in the Atlantic**CO-CHAIRS** Miguel Miranda, President of IPMA - Portuguese Institute for the Sea and the Atmosphere, PT

Sally McFarlane, ARM Program Manager, US Department of Energy, USA

Eduardo Brito de Azevedo, University of the Azores, PT

PARTICIPANTS Sally McFarlane, ARM Program Manager, US Department of Energy, USA

Paulo Fialho, University of the Azores, PT

Pavlos Kollias, Canada Research Chair in Radar Applications for Weather and Climate Research, Stony Brook University, USA

Patrick Heimbach, University of Texas at Austin, USA

John Cortinas, Director of the Office of Weather and Air Quality, NOAA, USA

12:40 WORKING LUNCH

Agenda

13:15 **Space Science and Systems for the Atlantic**

CO-CHAIRS Fausto Brito e Abreu, Azores Regional Secretary for the Ocean, Science and Technology, PT

Robert Peterson, University of Texas at Austin, USA

PARTICIPANTS Miguel Bélló Mora, Elecnor Deimos, Spain

Sérgio Barbedo, Thales-Edisoft, PT

Luís Santos, Regional Secretariat for the Sea, Science and Technology, PT

Marco Bravo, University of Texas at Austin, USA

14:15 **Ocean Science and Technology for the Atlantic**

CO-CHAIRS Helder Silva, University of the Azores, PT

Eric Lindstrom, NASA, US

PARTICIPANTS Ana Colaço, University of the Azores, PT

Arthur Baggeroer, Massachusetts Institute of Technology, USA

Ned Dwyer, EurOcean

João Tasso, University of Porto, PT

Karl Stromssen, Global Maritime Group, NOR

Maria João Bebianno, CIMA, University of Algarve, PT

Ramiro Neves, Instituto Superior Técnico – Universidade de Lisboa, PT

16:00 **SUMMARY**

Towards an integrative approach to space, climate and energy, earth and ocean R&D in the Atlantic

RAPORTEURS Chairs of the Thematic Sessions

17:00 **CONCLUDING REMARKS**

Paulo Ferrão, President of the Fundação para a Ciência e a Tecnologia (FCT), PT

António Rendas, Rector of Universidade Nova de Lisboa, PT

António Cunha, President of the Council of Rectors of the Portuguese Universities, PT

Manuel Heitor, Minister for Science, Technology and Higher Education - Portuguese Government

17:30 **CLOSING**

18:00 Networking, hosted by the Consul General - Portuguese Chancery in New York City

List of Participants in the 1st workshop

NAME	ORGANIZATION
Ana Colaço	IMAR/MARE, University of the Azores
António Cunha	CRUP, University of Minho
António Rendas	Universidade Nova de Lisboa
Allan Goodman	Institute for International Education
Arthur B. Baggeroer	MIT
Bruce Tidor	MIT
Carlos Santos Silva	IST, Universidade de Lisboa, PT
Douglas Hart	MIT
Eduardo M. Azevedo	University of the Azores
Emir Sirage	Fundação para a Ciência e a Tecnologia (FCT)
Eric Lindstrom	NASA
Fausto Brito e Abreu	Government of the Azores
Francisco V. Cunha	CEIIA
João Tasso de Sousa	FEUP
José Fonseca de Moura	CMU
John Cortinas	NOOA
Juan Sanchez	UTAustin
Juan T. Hernani	Satlantis
Karl Stromsem	Global Maritime group
Luís Santos	Government of the Azores
Manuel Heitor	Minister for Science, Technology and Higher Education (MCTES)
Manuela Bairos	Portuguese Chancery in New York City
Manuela Veloso	CMU
Marco Bravo	IC2 Institute - UTAustin
Maria João Bebianno	CIMA /University of Algarve
Marija D. Ilic	CMU
Miguel Bélló Mora	Elecnor Deimos
Miguel Miranda	IPMA
Ned Dwyer	EuroOcean
Nuno Ávila	Deimos Engenharia

NAME	ORGANIZATION
Patrick Heimbach	UTAustin
Paulo Chaves	ISQ
Paulo Ferrão	Fundação para a Ciência e a Tecnologia (FCT)
Paulo João de Lemos de Sousa Fialho	University of the Azores
Pavlos Kollias	ARM
Pedro Arezes	University of Minho
Pedro Conceição	UNDP
Ramiro Neves	IST, Universidade de Lisboa, PT
Robert A. Peterson	IC2 Institute - UTAustin
Rui M. Ponte	Atmospheric and Environmental Research Inc
Sally McFarlane	US Department of Energy
Scott Van Broekhoven	MIT
Sérgio Barbedo	Edisoft
Soumya Kar	CMU
Teresa Ferreira	University of the Azores

Azores International Research Center (AIR Center): A preliminary note

The potential installation of an Azores International Research Center (AIR Center), based on existent infrastructures, namely the Portugal-USA Lajes airbase in 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 to 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 the Atlantic.

This Center, through a flexible international governance model with international statute and international legal personality (i.e., emulating from the CERN experience, in Geneva, among others), would provide immunity from legal process, surpassing national constrains and 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 the Azores islands to be 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, environment monitoring.

Antenna for VLBI/SKA in São Miguel: AIR Center to 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.

Azores International Research Center (AIR Center): A preliminary note

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), to currently 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 and support development. The HAX radar is similar in physical characteristics, performance and latitude.

Atlantic Spaceport: The Lajes Airfield in Terceira has 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 hydrothermal 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.

The Azores

COUNTRY

Portugal

AUTONOMOUS REGION

Azores

ISLANDS

Corvo
Faial
Flores
Graciosa
Pico
São Jorge
São Miguel
Santa Maria
Terceira

REGION

Atlantic Ocean

SUBREGION

Mid-Atlantic Ridge

POSITION

Azores Platform

AREA

2,333 km² (901 sq mi)

POPULATION

245,746
(in 2012) Census 2011

THE AZORES

The Azores, officially the Autonomous Region of the Azores (Região Autónoma dos Açores), is one of the two autonomous regions of Portugal (the other being Madeira).

The archipelago is composed of nine volcanic islands in the North Atlantic Ocean, about 1,360 km (850 mi) west of continental Portugal and about 4,121 km (2,561 mi) east of New York City.

The Azores extend along a west-northwest to east-southeast orientation in an area approximately 600 kilometres (373 miles) wide.

