

# Atlantic Interactions

*Integrating Space, Climate, Oceans and Data Sciences  
through North-South / South-North Cooperation*

**High-level Industry-Science-Government Dialogue**  
*Towards the Atlantic International Research Center (AIR Center)*

Terceira, Azores, 20-21 April 2017

## Conclusions

The High Level Industry-Science-Government Dialogue on 'Atlantic Interactions', held in Terceira island on the 20-21 April 2017, was aimed to address the need to further study and conduct research in Atlantic regions in terms of related natural resources, ecosystems dynamics and the interdependences with human activities towards achieving the 2030 United Nations goals for sustainable development, together with the potential exploration of new avenues for knowledge-based economies in south and north Atlantic.

The participants acknowledge the achievements on Atlantic related research over the last five years with the signature of the '*Galway Statement on Atlantic Ocean Cooperation*', on 23 May 2013 between the European Union, the United States and Canada, which enabled the alignment of ocean observation efforts, as well as the priorities and actions outlined in the *Atlantic Ocean Research Alliance*. In addition, the participants have also noted that the results of the series of workshops on 'Atlantic Interactions' held throughout 2016 in New York, Ponta Delgada, Lisbon, Brussels, Paris, Brasília, Cartagena, Bogotá, Cambridge (Mass) a Austin (Texas), as well as other related meetings in Bangalore (India), Luanda (Angola) and Abuja (Nigeria) have mobilized researchers worldwide towards the development of a new science and technology agenda for an integrative approach to the Atlantic focused on space and ocean sciences, as well as the implications of climate change and the development of sustainable energy systems. Participants also note the progress achieved by Southern nations in discussing and establishing a scientific agenda for the Tropical and South Atlantic and the Southern Ocean.

The imperative of building knowledge-based societies demands an investment in our collective institutions to enable them to provide worldwide access to quality science education and scientific practices to everyone, regardless of age, origin or social and economic background. People at large will need to access knowledge and modern learning practices at all ages to build future generations who are becoming increasingly knowledgeable, creative and able to adapt responsibly to the challenges of a rapidly changing world. The future of different people on earth are woven in a single garment. We all gain from the joy and benefits of discovery when all people participate in learning and the productive use of knowledge. This means reaching out and engaging our colleagues, scientists and lay people with young people in all parts of the world.

**Each generation should be able to explore new things and have the opportunities to do so.**

Participants have agreed that a better understanding of Atlantic regions in terms of their response to climate change and for the sustainable management of common resources entails the alignment of research and economic strategies through north/south - south/north international cooperation.

In addition, Participants recognize:

- The **relevance of an integrative approach to space, climate change and energy, earth and ocean sciences in the Atlantic**, together with emerging methods of **data science, data visualization and science communication** to better understand the emerging issues associated to climate change and the sustainable management of common resources affecting our planet and the lives, prosperity and wellbeing of our citizens.
- The need to foster and further develop a shared and international environment to support **North-South/South-North cooperation in science and technology** towards new climate, earth systems, space, and marine research activities benefiting decision makers, public users, higher education and industry, as well as to foster highly skilled human resources, the exchange of research infrastructures and technology transfer and contribute to growth.
- The urgent need to **develop advanced data and network systems** including integrated instruments for space, air, ground and ocean domains, allowing sustained data gathering to produce better and more precise models which can supply all scientific disciplines involved in accurately projecting the future sustainable pathways. This requires a sustained and globally distributed ocean-observing system, especially at depths where very few observations currently exist, as well as detailed measurements of atmospheric circulation changes, along with the determination of the Earth's key ecosystems activities and the development of technology to fit science needs. These challenges will require stronger linkages with the educational system to develop curricula for critical and needed skills on data management, artificial intelligence and analytics linked with advanced computing technologies, based on cognitive, high performance computing and cloud platforms which can be secure and scalable.
- The relevance of **space science and technology** in Atlantic regions to address great challenges such as climate change, natural hazards, energy dependency and sustainable ocean exploitation, considering that satellite data processing opens opportunities for new ventures with economic, environmental and social impact, in areas such as fisheries and aquaculture, maritime safety, managing of marine resources, as well as characterizing the renewable energy potential in islands and coastal environments.
- The urgent need to foster **knowledge as our common future**, and to recognize the need **to bring to the center of our attention all of those in the "margins" of knowledge driven societies and knowledge-based economic activities** by increasing social and gender equality, fostering inclusion for everyone, everywhere, anytime, recognizing the need to effectively promote responsible science and innovation for all.
- The opportunity **Azores offer for the potential development of international launch services to space**, providing low-cost, frequent and regular access to space for small satellites as a way to boost the utilization of space for the benefit of all citizens of planet Earth. The islands of Azores have been identified as a promising launching site thanks to feasibility studies recently performed. These preliminary technical studies have shown that an Azorean spaceport would offer a wide range of Azimuth and good metrological conditions, which may enable regular, and frequent launches. It would

benefit from and leverage the current Azorean space infrastructures. Further studies are necessary to guarantee adequate safety, environmental protection, geological stability conditions or electrical and water capacity.

- The critical role of **Atlantic islands as ecosystems suitable for holistic research studies** through experiments and observation of natural processes. They represent natural living laboratories enabling and facilitating the design of scientific studies of international relevance. Island research stations are ideal for designing and achieving direct and precise observations especially required for studying biophysical phenomena, but also for validating concepts, techniques, and methodologies, particularly in remote places and/or in circumstances where reliable platforms are scarce.

It is under this context that the participants of High Level Industry-Science-Government Dialogue on 'Atlantic Interactions' have identified the following major steps to be pursued:

1. The need to **align research strategies** through international cooperation to face Atlantic regions challenges and economic transitions towards the sustainable development of our societies. Environmental changes, security conditions, natural hazards, and other human dimensions, calls for the design of an international partnership that aims for resilience and sustainability for the Atlantic and related North-South / South–North cooperation in the following **five thematic areas: *Space systems and applications; Atmospheric science; Climate change and energy systems; Ocean systems, and Data sciences.***
2. Greet the efforts developed in setting a **bottom up strategic research agenda** through an integrative approach to Space, Climate-Energy, Oceans and Data Sciences in the Atlantic, to support **North-South/South-North cooperation in science and technology**, ultimately benefiting decision makers, public users, universities and industry, as well as fostering highly skilled human resources, the exchange of research infrastructures and technology transfer and contribute to the sustainable growth of our countries and regions.
3. Support the idea of the need to guarantee an increasing effort and global initiative on **“Knowledge for Space - Space for knowledge”** aiming to promote scientific education and culture about emerging space systems and technologies, as well as to better use space technology to promote scientific and education contents for all, in every region of the planet. The Atlantic regions could be used as a platform to foster a pilot project in this direction.
4. Welcome the advances made to the draft version of the **White Paper “Towards a Science and Technology Agenda for an integrative research approach in Atlantic regions through North-South Cooperation”** and propose this strategic research agenda to be finalized and implemented through an international network of research, academic and business organizations worldwide, across both south and north Atlantic countries, as well as non-Atlantic countries, in an international scientific organization, bringing together infrastructures located throughout the Atlantic: the **Atlantic International Research Center (AIR Center)**, as an initiative to be established in the form of an inclusive international research network organization with headquarters in the Azores Islands.
5. Note that the **AIR Center** will consider the development of a **new interdisciplinary research platform and initiative**, extending the capabilities of research centers around the world and addressing the synergies between Space, Climate-Energy, Oceans and Data Sciences, and this would enhance the potential of the existing Atlantic research infrastructures since it would focus on disciplines that

combine more than one scientific area, acting as a catalyst for research and innovation in multiple domains ranging from renewable energies, to the interactions of the ocean with the atmosphere and global climate phenomena, the impacts of global changes on the open ocean and the deep sea, including their biodiversity, as well as blue economy.

6. Recognize that the AIR Centre should consider stimulating the necessary knowledge-driven conditions to better use the **strategic positioning of Atlantic islands** by establishing a **network of research sites** in Azores, Madeira, Canary Islands, Fernando Noronha and S. Pedro-S. Paulo, in Brazil, Cape Verde, Nigeria, South Africa, as well as and others to follow, thus increasing operational efficiencies by optimising the appropriate use and sharing of research infrastructures, and access to and management of data and platforms.
7. Propose that the creation of the **AIR Center should be attempted in the form of an international venture and an intergovernmental organization** to accomplish the following goals:
  - Promoting a **new holistic and integrative approach to knowledge on space, climate-energy, oceans and data sciences** and related issues in the Atlantic, fostering conditions to provide the world with more science, more knowledge and more scientific culture;
  - Fostering an **inclusive approach** to science, technology and economic development, bringing to the center of our attention all of those in the “margins” of knowledge driven societies and knowledge-based economic activities.
  - Establishing a **network of research sites in various Atlantic islands** in north and south Atlantic, in close interaction with research, academic and business organizations worldwide, including those across both south and north Atlantic countries, as well as non-Atlantic countries;
  - **Facilitating the access to space data** from the unique position of the Azores, promoting access to new frontiers of knowledge, together with the development of **new space industries**;
  - Stimulating the **test of new renewable energy sources** and their integration in smart networks in islands environments, promoting test beds for the development of new sustainable energy industries;
  - Promoting **new research in deep-sea**, facilitating the access to a better understanding of living organisms in extreme environments and new energy and mineral sources;
  - Fostering the study of earth processes in the Atlantic triple junction, where three major tectonic plates met, to contribute for the understanding and risk mitigation of the derived natural hazards, namely earthquakes, volcanism, tsunamis.
  - Facilitating the establishment and use of **new mega-sets of data on climate, atmospheric, earth, ocean and energy related themes** stimulating new forms of data science and the development of new technology-based companies oriented towards big data processing and usage.
  - Promoting and fostering the education and knowledge agenda “**knowledge for space/ Space for knowledge**” and its integration with ocean, earth and climate education in a holistic way, fostering the interest and mobilization of younger generations for science and technology, as well as contributing for educating more children everywhere, anytime.
8. Welcome **AIR 's Center openness to the world** by establishing different forms of scientific and technological collaboration with public and private entities from non-Atlantic countries across the globe, thus providing a truly international shared environment, which will promote amongst others, the development of comparative studies and projects on other seas, oceans, such as the Indian, Artic, and Pacific Oceans and the Mediterranean.

9. Recognize the support jointly offered by the Fulbright Commission Portugal and the Portuguese Science and Technology Foundation to launch a "**Fulbright Award on Atlantic International Research**" to be promoted until the end of 2017 in close collaboration with the establishment of the AIR Center.

Consequently, the participants of High Level Industry-Science-Government Dialogue on 'Atlantic Interactions' invite:

- All participants of the High Level Industry-Science-Government Dialogue on 'Atlantic Interactions', to **deepen the dialogue** to advance new research on the Atlantic and promote new models for North-South/South-North partnership-based approach which can contribute to the sustainable management of all our societies.
- The Portuguese Government and the Regional Government of Azores, together with the Portuguese Foundation for Science and Technology, FCT, to **promote an open international process and competition to attract business leaders and entrepreneurs worldwide to further discuss the development of international launch services to space from the Azores**, providing low-cost, frequent and regular access to space for small satellites as a way to boost the utilization of space for the benefit of all citizens of planet Earth.
- The Portuguese Foundation for Science and Technology, FCT, to establish a small, high level, expert committee to guarantee the **conclusion of the White Paper "Towards a Science and Technology Agenda for an integrative research approach in Atlantic regions through North-South Cooperation"** before the end of September 2017, including the following members:
  1. Juan Maria Vazques Rojas, General secretary of Science and Innovation, Spain
  2. Jailson Bittencourt, Secretary for Policies and Programs, Brazil
  3. Patrick Heimback, University of Texas at Austin, USA
  4. Stewart Bernard, Council of Scientific and Industrial Research, South Africa
  5. Paulo Ferrão, President, Portuguese Foundation for Science and Technology (Chair)
- The Portuguese Government and the Regional Government of Azores, together with the Portuguese Foundation for Science and Technology, FCT, to facilitate the efforts to set up a **high level working group** composed by representatives of Governments, industry, research and academic organizations interested in moving forward the establishment of the AIR Center. **The members of the working group will meet in Lisbon by July 2017 and prepare a joint implementation and financial plan towards the establishment of the AIR Center, by the end of 2017.** The **working group** will include the following members (Others to be confirmed):
  - Juan Maria Vazques Rojas, General secretary of Science and Innovation, Spain
  - Jailson Bittencourt, Secretary for Policies and Programs, Brazil
  - Juan Sanchez, University of Texas Rio Grande Valley, USA
  - Stewart Bernard, Council of Scientific and Industrial Research, South Africa
  - United Kingdom (expert to be confirmed)
  - Tony Lewis, Center for Marine and Renewable Energy, University College Cork, Ireland
  - Federal Ministry of Science and Technology, Nigeria (expert to be confirmed)
  - European Space Agency (expert to be confirmed)
  - Cape Verde (expert to be confirmed)
  - S. Rakesh, Chairman, ANTRIX, India
  - Argentina (expert to be confirmed)

- António Alberto Alcochete, Director, National Directorate for the Evaluation and Accreditation of Science and Technology , Angola
  - Italy (expert to be confirmed)
  - Carlos Enrique Arroyave Posada, Vice Rector, University of Antonio Nari
  - Bulgaria (expert to be confirmed)
  - David González, Director of Science and Technology, Uruguai
  - Azores Regional Secretariat for Sea, Science and Technology (expert to be confirmed)
  - Paulo Ferrão, President, Portuguese Foundation for Science and Technology (Chair)
- All stakeholders involved in the **establishing the AIR Center** should attempt to finalize the ratification of the AIR Center legal instrument by the beginning of 2018 and to complete the initial installation by the end of 2018. To guarantee achieving this objective, **a meeting will be organized in the end of November 2017 in Brazil** (date and venue to be informed until July 2017).

**Annex: List of participants** (per country, in alphabetic order)