

# interview to **Commander Juan Antonio Aguilar**

Frigate Captain BIO Hespérides



Hespérides vessel in the Antarctic

Frigate Captain Juan Antonio Aguilar Cavanillas was born in Madrid (Spain) in 1960. He joined the Spanish Naval Academy in 1980, and was commissioned as ensign of the Royal Spanish Navy in 1985. He is a systems analyst and specialist in hydrography, and was awarded a diploma in operational research by the Naval Postgraduate School of Monterey, California. He has served on the corvette DIANA, the training ship JUAN SEBASTIÁN DE ELCANO and the hydrographic ship MALASPINA, of which he was Second Officer.

On land, he has held posts in the Fleet Tactical Programs Center, the Navy's Cabinet of Operative Military Research (GIMO) and the Naval Hydrographic Institute. He has been commander of the POLLUX and MALASPINA hydrographic ships. He has been the Commander of the HESPÉRIDES oceanographic research ship since 18 June 2009.

*“The Antarctic Treaty expresses the intention that the ice continent should continue to be used solely for peaceful purposes”*

It might seem that there is nothing left to discover on our planet, and indeed that no international agreements are respected. Nevertheless, the ice of the Antarctic and the waters that surround it still hold some keys to understanding the behaviour of the Earth and to forecasting how it will develop. Moreover, this continent is the subject of the Antarctic Treaty which -since 1961- has guaranteed its neutrality as well as the protection of its environment and the natural resources in which it abounds. But in order to carry out research in this glacial region, it is necessary first to reach Antarctica and then to be able to rely on a human team backed up by highly sophisticated technical equipment. Thanks to the detailed explanations given by Commander Aguilar in this interview, we shall learn how the Spanish vessel *Hespérides* is making it possible to accomplish this important international scientific mission.

**12 March 2010 marked 20 years since the launch of the *Hespérides*, prompting us to wonder how the idea of building a vessel for the purpose of international oceanographic research took shape in Spain. Does the name *Hespérides* have any particular significance?**

The idea of building the *Hespérides* materialized during the Second Week of Marine Studies held at Cartagena (Murcia-Spain) in November 1984, following Spain's signing of the Antarctic Treaty two years previously. During that week, there were discussions which led to the conclusion that it would be appropriate for Spain to have an oceanographic vessel

with Antarctic navigation capabilities, due not only to our presence on that continent in the form of the Juan Carlos I Base and the Gabriel de Castilla station, but also to the interest shown in it by Spain's scientific community.

The name of the ship alludes to Greek mythology. The *Hesperides* were nymphs who guarded the Tree of Knowledge, which is also the logo of the Spanish National Research Council (CSIC).

**Which organizations finance your activities, and which areas of knowledge are covered by your research projects?**

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Juan Carlos I Antarctic Base on Livingston island. MICINN

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The scientific research undertaken on board the *Hespérides* is basically directed and financed by the National Research and Development Plan; responsibility for the scientific management of the vessel (as part of the "Major Infrastructure") lies with the Ministry of Science and Innovation (MICINN) acting through the Commission for Coordination and Support for the Activities of Oceanographic Vessels (COCSABO). Various bodies from other ministries also participate in this Commission.

The logistical support and the technical and scientific personnel required to undertake the missions are provided by the Marine Technology Unit (UTM) of the Spanish National Research Council (CSIC). It should be remembered that the vessel and its equipment both belong to the Spanish Navy and this also entails the presence of the Ministry of Defense.

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**Which scientific work can be undertaken with the equipment available on board?**

The *Hespérides* oceanographic research vessel accommodates several laboratories where research can be undertaken in various scientific disciplines; these include a low-temperature laboratory (kept at  $-20^{\circ}\text{C}$ ), what is known as the "Wet Process Unit" with a continuous distribution circuit for surface seawater, and one laboratory which is specifically equipped for work with radioactive isotopes, with capacity for storing the waste residues produced.

Key items of the permanent scientific equip-



Hespérides vessel in the Antarctic

ment on board include two multibeam echosounders, one for deep water down to 11,000 meters (EM-120) and the other for shallow water down to 600 meters; two monobeam echosounders, the EK-60 to quantify biomass and the EA-600 for bathymetric/hydrographic work, one TOPAS seismic profiler with sediment penetration capability of up to 250 meters, one Acoustic Doppler Current Profiler (ADCP) and two seismic shooters.

One of the most frequently used items of equipment is the CTD dipping sounding line, which can reach depths of as much as 6,000 meters to collect samples of water simultaneously at different levels; this is normally used to measure conductivity, temperature and turbidity and for fluorometry. We can also use 10- and 20-foot containers to carry other items, in particular the equipment used on our seismic assignments (shooters and streamers, or marine cables). The vessel

can also launch radiometers, fishing nets, drift bottles, corers (used to obtain samples from the seabed with lengths of up to 10 meters) and trawls to obtain samples from the seabed as well as the rest of the water column.

The ship also has a meteorological station linked to the TERASCAN system, which can receive and fully process real time data from satellites in the NOAA (National Oceanic and Atmospheric Administration) series, and can also handle various levels of processing for data from other satellites: GOES, GMS, METEOSAT, FY, DMSP, ERS, SPOT and CZCS.

#### **How is the route of the Hespérides vessel tracked from land and how are communications handled?**

The vessel has various satellite communication systems -INMARSAT, SECOMSAT, IRIDIUM and TERASCAN- which can receive

**Ice navigation calls for some specific operating methods and safety precautions, especially in areas where cartography is poor and often inaccurate**

and fully process real time data from satellites in the NOAA series. This provides cover with global capacity, including high latitudes. It also has VHF, UHF and HF radio voice and data communication equipment.

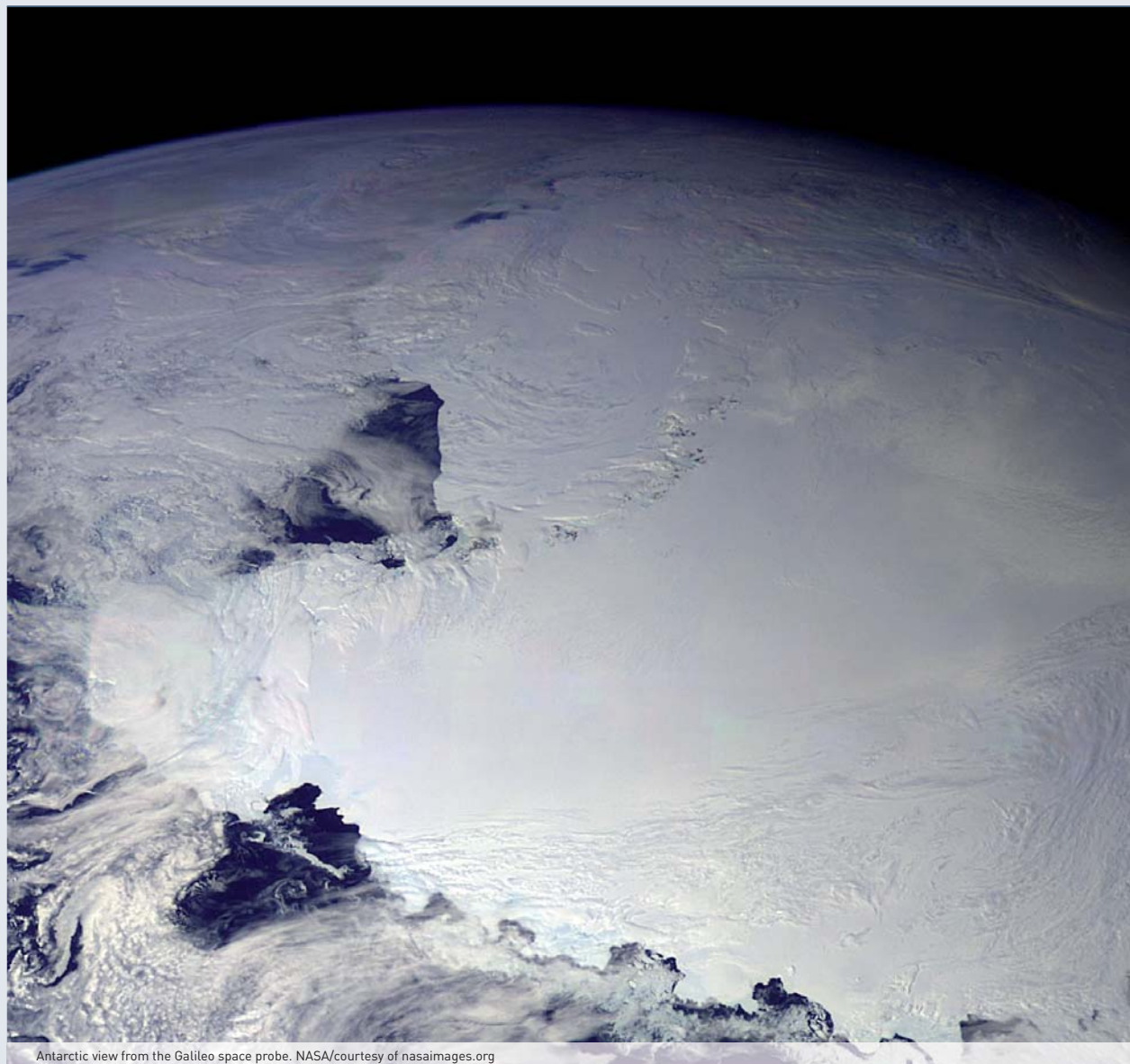
**What logistical support is provided by the *Hespérides* vessel and its crew for the Spanish Antarctic bases, “Juan Carlos I” on Livingston Island and “Gabriel de Castilla” on Deception Island?**

In actual fact, logistical support for the Antarctic bases is mainly provided by another Spanish Navy vessel, the *Las Palmas* oceanographic research ship. This vessel is responsible for transporting staff and supplying water, food and spare parts to the bases, and for removing waste. Nevertheless, the

*Hespérides* often assists the Spanish bases and others belonging to other countries, for example by transporting relief staff.

**Who draws up the safety documentation for the *Hespérides* vessel? Which particular procedures are required for navigation in Arctic and Antarctic waters?**

Navigation in waters where there is ice calls for some specific operating methods and safety precautions. We must also bear in mind that these are areas where cartography is poor and often inaccurate. All these factors, together with the fact that GPS positioning systems are not reliable at these latitudes, make it necessary to establish special navigation procedures. The documentation for polar navigation is drawn up by the vessel crew on



the basis of lengthy experience on board the *Hespérides*, and it is subsequently approved by the Navy. The officers of the *Hespérides* also attend specific courses on polar navigation in Chile and Argentina.

**How does insurance cover operate in cases of general average, towing, collision or other more complex situations?**

In fact, the *Hespérides* vessel is not insured by any company as such, because it is a vessel that belongs to the Spanish Navy which manages all actions to be taken in case of an exceptional event of this sort.

**What health and medical cover can be provided for personnel on board if necessary? And what happens if personnel have**

**to be transferred to land or repatriated to Spain?**

A doctor and a medical assistant are always on board during our missions. The vessel has a sick bay for primary medical care, and an X-ray room. If personnel have to be transported ashore or repatriated, the Navy handles all the transfers. If an emergency evacuation by helicopter became necessary, it would be coordinated with the marine rescue services of the relevant country, or its navy. I should point out that everyone has to pass a specific and mandatory medical examination before embarkation.

The Navy personnel have a group insurance policy taken out by the Ministry of Defense. Civilian personnel on board also have their own policy.

## The Antarctic Treaty

This is a composite framework of legal regulations at international level. It recognizes the Antarctic as a region of interest for the entire human race, and expresses the intention that it should continue to be utilized solely for peaceful purposes, and should not become the scene or subject of international disagreement. Various other accords have been drawn up to flank the Antarctic Treaty: the Protocol on Environmental Protection to the Antarctic Treaty, the Convention for the Conservation of Antarctic Seals, the Convention for the Conservation of Antarctic Marine Living Resources and the Convention on the Regulation of Antarctic Mineral Resource Activities, all of which make up the Antarctic Treaty System.

The Antarctic Treaty was drafted in 1959 and came into force in 1961. It was initially signed by the governments of Argentina, Australia, Belgium, Chile, France, Japan, New Zealand, Norway, South Africa, the former USSR, the UK and the USA. Further countries then acceded to the treaty in two categories: consultative parties (up to a total of 28) and acceding parties (19 countries).

Spain signed the Antarctic Treaty in 1982 and became a consultative party in 1988. Like the other members, Spain is committed to global protection of the environment and the dependent and associated ecosystems. It also undertakes to contribute toward the establishment of a sound basis to continue and develop international scientific cooperation in the Antarctic, underpinned by freedom of research. For this purpose, Spain has two scientific stations. One of these is managed by the Ministry of Science and Innovation through the CSIC: this is the "Juan Carlos I" Spanish Antarctic Base, located on Livingston Island. The second station is managed by the Ministry of Defense through the Spanish Army: this is the "Gabriel de Castilla" Spanish Antarctic Base, located on Deception Island. To support these bases, as mentioned above, we rely on the Las Palmas oceanographic research vessel as the main logistical support ship, and the *Hespérides* oceanographic research vessel also provides support as necessary, bearing in mind that its main mission is oceanographic research in the waters near the Antarctic continent.

**Let's talk about some difficult situations that the Hespérides oceanographic research vessel has experienced. Is it true that it had to assist a tourist boat in Antarctic waters in February 2009?**

Yes indeed, the inclement Antarctic climate and the difficulties of navigation in polar regions sometimes lead to complex situations for vessels working in this area.

In February 2009, we received a call for help from the Marine Rescue Service at Ushuaia (in southern Patagonia, Argentina). A passenger vessel had run aground on the coast of Audrey Island. The katabatic winds blowing down from the glaciers and the sea current made it impossible to refloat the ship. As we were the nearest vessel, we went to assist. The divers from the Hespérides reconnoitered

the hull to assess the situation and to look for any holes below the water-line or fuel leaks. We continued to support the ship until all the passengers could be evacuated and later on, when the tide came in and the weather conditions improved, it was able to leave.

**Are there any other ships in the world that carry out oceanographic research, so that scientists can be exchanged and knowledge and experience can be shared?**

In Spain alone, there are 18 other vessels that carry out oceanographic work. Some of them belong to the Spanish Oceanographic Institute, and others are operated by the CSIC, SEGEPESCA (General Secretariat for Marine Fisheries) and also the Naval Hydrographic Institute. However, it is true that the

Hespérides vessel on the Antarctic



Hespérides is the most important of these ships, the one with the best multidisciplinary versatility, and the only one that is able to navigate polar waters.

Many of the major world powers are involved in oceanographic research, and countries such as the USA, France, the UK and Canada have large fleets.

We often carry scientific personnel from foreign organizations on board the Hespérides, thanks to cooperation among various universities. And we frequently carry an observer when we are working in waters belonging to other countries. Last year, we were accompanied by researchers from France, the UK, Germany, Portugal, the USA, Brazil, Chile, Argentina and China.



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### **A crew aboard a “green ship”**

All the crew are of Spanish nationality except for one sailor who is a national of Uruguay; the crew comprises the commander, 10 officers, 10 non-commissioned officers and 35 petty officers and seamen, including four women.

The vessel also has capacity to carry 37 additional passengers as technical and scientific staff.

As regards waste management, the vessel is equipped to comply with the strictest requirements of the Antarctic Treaty. Waste is separated on board and the ship is equipped with a crusher, an incinerator and a compactor so that it can be stored on board until arrival in port. There is also a waste water treatment plant on board. We can proudly claim that the Hespérides vessel is a “green vessel”.

