

el Periòdic News

INTERVIEW

Javier Cacho

PHYSICIST AND ONE OF SPAIN'S FOREMOST POLAR EXPLORERS

«Catastrophic ice melt scenarios in Antarctica are unrealistic»

IRINA
Rybalchenko



Javier Cacho Gómez is a physicist, researcher, writer, and one of Spain's leading figures in the exploration of the polar regions. His scientific journey began in the 1980s at the country's National Commission for Space Research (CONIE), where he focused on the study of the ozone layer—an area of inquiry that would shape much of his career.

That work culminated in the 1989 publication of *Antarctica: The Ozone Hole*, a groundbreaking book that was not only the first in Spanish on the subject but also the second of its kind in the world.

In 1986, Cacho took part in Spain's first scientific expedition to Antarctica—a defining moment that set the course for his future. He would return to the continent many times, including enduring the harsh Antarctic winter, to continue his ozone research. He later served as head of multiple missions and was appointed commander of the Juan Carlos I Antarctic Base, Spain's primary scientific outpost in the region.

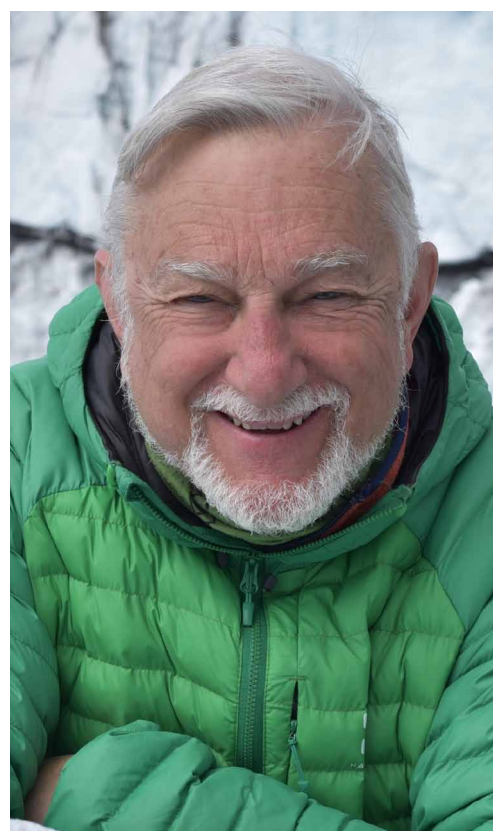
But Cacho's impact extends beyond science. He is also an accomplished communicator and advocate for public understanding

of polar science. Blending scientific insight with storytelling, he has written children's tales and narrative works inspired by his experiences in Antarctica, including *Piti's Adventures in Antarctica* (Ediciones Tao, 2001). He frequently tours the country giving lectures—particularly to students—sharing the wonders and urgency of the polar world with audiences of all ages.

—Could you tell us about your participation in Antarctic expeditions and how your scientific and outreach work has evolved over the years?

—I'm an atmospheric scientist, and my research has long focused on the atmosphere—particularly the ozone layer. When the alarming depletion of ozone over Antarctica was discovered in 1984, I, like many scientists working in this field, felt compelled to go there. At that time, Spain was organizing its first scientific expedition to the continent. I volunteered—and was accepted.

Over time, my career gradually shifted. Scientific work gave way to writing and education. Sharing knowledge has always been deeply important to me, especially when it comes to such a fascinating subject as the ozone hole and Antarctica. For nearly fifteen years now, I've been writing about the region—its natural wonders, the history of



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its exploration, and the legendary polar adventurers who shaped our understanding of it.

I've written extensively about Roald Amundsen, the Norwegian explorer who became the first person to reach the South Pole in 1911; Robert Falcon Scott, the British naval officer whose tragic expedition followed soon after in 1912; and Ernest Shackleton, renowned for his heroic leadership during the ill-fated *Endurance* expedition. My curiosity eventually led me northward as well, to the Arctic, where I discovered a wealth of equally compelling stories. One of them inspired me to write a book on Fridtjof Nansen, whose daring ski crossing of Greenland in 1888 marked the first successful attempt to traverse the island.

Though I'm now officially retired, I continue to give lectures and talks whenever I'm invited. The polar regions still captivate me—and I hope they'll continue to inspire others too.

—What does Antarctica mean to the world? After all, it seems like a remote, bleak place—almost entirely covered in ice...

—Antarctica is a symbol of hope for

all of humanity. It is a new continent, discovered only recently—just about two hundred years ago. All the other continents had been known long before. For example, New Zealand was discovered by Europeans in 1642, while Antarctica wasn't reached until 1820. The reason is simple: getting there was incredibly difficult.

And yet, we did it. And what we found was astonishing. Antarctica is enormous—14 million square kilometers. It is covered by an ice sheet with an average thickness of more than three kilometers. It is the coldest place on Earth and one of the key climate centers of the planet, alongside the North Pole and the equator. This is where ocean currents are born, currents that distribute heat and cold across the globe.

That's Antarctica's geographical importance. But for humanity, Antarctica is above all a symbol of hope—because it is here that an agreement was reached that still holds to this day.

Antarctica is a land without borders. There are no weapons, no armies, no military bases. If military personnel are present, it is only to support scientific missions. It is a continent open to all scientists. Any country can establish a research station here, anywhere it deems appropriate. There is no need to ask anyone's permission, because Antarctica belongs to no one.

It is a unique place where countries have managed to come to an agreement. Stations are shared. Ships are shared. Aircraft are shared. And most importantly, there is a spirit of cooperation and solidarity among the people who work in Antarctica. All of this was made possible thanks to the Antarctic Treaty, which came into force in 1961.

This happened at the height of the Cold War, when tensions be-

tween the U.S. and the USSR were extremely high. And yet, twelve countries came together and decided to create something unique—something that belonged to no one. Some of them had already laid territorial claims, but they agreed to set them aside and work together. That was a real sign of hope.

Antarctica is not just a vast, icy continent. It is a reminder that we once managed to overcome our differences.

—Antarctica is a largely unexplored continent that, in addition to ice, holds valuable resources. What is your opinion? Should research in Antarctica continue?

—The extraction of natural resources, including minerals and fossil fuels, is strictly prohibited in Antarctica. Although there is evidence of significant reserves of oil and gas beneath the continent, these have been deliberately left unexplored. Scientists have found indications of their existence—but that's all we know.

Rare minerals and large deposits of iron ore have also been discovered. Yet, under the Antarctic Treaty, which governs all activity in the region, the extraction of these resources is forbidden.

—Is there oil in Antarctica? And when might its extraction be allowed?

—Yes, it is highly likely that oil exists in Antarctica, but its extrac-

tion is strictly prohibited. This prohibition is established by the Antarctic Treaty, originally signed by 12 countries in 1959 and now ratified by 56 nations. According to the Madrid Protocol, adopted in 1991, all activities related to the extraction of mineral resources—as well as any military operations—are banned on the continent. The protocol is set to remain in force for 50 years, until 2048. Until then, any resource extraction in Antarctica remains illegal.

In 2048, the Madrid Protocol will come up for review. The signatory countries will need to decide whether to extend it or amend its provisions. That decision must be made by consensus.

However, the global landscape has changed. Respect for international agreements has weakened in recent years, and that creates uncertainty about the future commitments of states. In the past, signing a treaty implied legal and political responsibility that extended beyond changes in government. This principle of continuity was a foundation of international law for decades.

—What are the long-term environmental and social consequences of Greenland and Antarctic ice melt, and how might this accelerate global climate change?

—I believe the consequences won't be immediate. We are doing the right thing by striving to be responsible toward the environment. The

melting of Greenland's ice sheet is an inevitable process. Greenland is a remnant of the last Ice Age, and its melting will happen gradually, as all scientists agree.

—Could this accelerate climate change? Yes, it's possible. Scientists estimate that Greenland could largely melt within the next 100 to 200 years.

—So there is no need to panic—we still have time to act. Similar processes are happening in Antarctica, which has experienced warmer climate phases than previously expected. Despite these changes, significant ice loss there is unlikely.

Climate change will be felt most strongly in the polar regions because the ice there is especially vulnerable, particularly in the Arctic. In Antarctica, the situation is less critical: some melting may occur in certain areas, but it won't cause a major rise in sea levels. Overall, catastrophic scenarios linked to ice melt do not currently seem realistic.

—How do climate change and human activities affect Antarctica's flora and fauna, and what measures are taken to protect the ecosystem from invasive species?

—Antarctica lacks traditional flora, but climate change and increasing human activity—especially tourism—are creating new threats to the local ecosystem. Rising temperatures and growing numbers of

visitors increase the risk of invasive plant and animal species being introduced via boots and equipment, allowing them to survive in areas where they previously could not. This poses a serious risk to the fragile ecosystem, as invasive plants can outcompete native species and disrupt the natural balance.

To minimize this impact, tourist vessels are equipped with special cleaning machines designed to remove seeds from footwear.

The problem extends beyond flora to fauna as well. For example, rats have appeared on South Georgia Island, threatening local bird populations by eating their eggs. These invasive species pose a severe danger to chicks, as there were no rodents on the island before their arrival. In response, eradication programs have been implemented to protect native wildlife. Such measures are a vital part of preserving Antarctica's ecosystem.

—How often do scientific expeditions take place in Antarctica? What are researchers working on today?

—Numerous expeditions continue to operate in Antarctica today, with scientists studying a wide range of priority topics—from microbiology and wildlife to climate change and plant life. This work reflects the principle of “freedom of scientific research,” allowing researchers to choose their areas of study based on their interests and the significance of the issues. ●

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