

Three months in the Antarctic to unlock the secrets of our climate

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The Russian scientific vessel Akademik Treshnikov. Credit: AARI

The Antarctic Circumnavigation Expedition (ACE), the first project run by the Swiss Polar Institute (SPI), will set sail this evening from South Africa. The Akademik Treshnikov is a Russian research vessel that has been chartered for this expedition. It will carry nearly 60 researchers around the southernmost continent on a data-gathering voyage in a bold initiative to improve our understanding of the impact of climate change

in the Southern Ocean. A new chair – the Ingvar Kamprad Chair of Extreme Environments – will also be made official today.

The time has come. The Akademik Treshnikov will leave the port of Cape Town, South Africa today on the three-month Antarctic Circumnavigation Expedition (ACE). The imposing Russian research ship will carry over 120 people: some 60 researchers from 30 different countries and about the same number of crew members. In addition to circumnavigating Antarctica, they will visit around twelve subantarctic islands.

This is the first project put together by the Swiss Polar Institute (SPI). It was Frederik Paulsen, a businessman and major philanthropist, who came up with the idea. He is also providing the ACE expedition with logistical backing, drawing on his extensive experience in Arctic exploration. Additional support is being provided by Presence Switzerland, a unit of the Federal Department of Foreign Affairs.

The idea behind the ACE expedition is to measure and quantify the impact of environmental changes and pollution in the Southern Ocean. This region plays a key role in climate regulation: currents of icy water deep in the ocean travel from the poles toward the equator, while warm water and air move across the ocean's surface towards the cold regions. The earth's climate can thus be compared to a huge heat engine. This process of heat transfer between polar and tropical regions is also an important component of the carbon cycle and a key factor in the oceans' ability to store CO₂.

"The poles are essential for climate balance, but they are also the regions where changes are most apparent: that's where the largest temperature differences have been recorded," said Philippe Gillet, vice president of EPFL, director ad interim of the SPI and a specialist in Earth and planetary science.

From plankton to microplastics

Twenty-two research projects will be run during this trip by teams from Switzerland, the UK, France and Australia, to name a few. The projects were selected by a panel of international experts following a call for proposals organized jointly by the polar institutes of eight countries: South Africa, France, Australia, New Zealand, Great Britain, Norway, Russia and Switzerland.

The projects cover a wide range of fields, including glaciology, climatology, biology and oceanography. The topics of study include wave formation, geographical variations in plankton populations, chemical exchanges between air and water, biodiversity on the islands, the ocean's CO₂ storage capacity, microplastic pollution and its impact on fauna, and an acoustic analysis of whale populations. This expedition will also build bridges between the various scientific fields. Not only will the researchers collaborate in their on-ship research, but they will build relationships that will set the stage for future collaborations at the international level.

The first Maritime University successfully completed

The ACE expedition was preceded by the ACE Maritime University. Fifty students studying marine and earth sciences at universities around the world took part. They boarded the Akademik Treshnikov on 19 November in Bremerhaven, in northern Germany, and reached Cape Town on 15 December. The young researchers took intensive theory-oriented classes and then engaged in hands-on practicals that taught them different sampling and analytical techniques and how to handle basic instruments. The students also used this opportunity to learn about their peers' work in other fields.

A chair for the study of extreme environments

The SPI also has a new chair, which will be formalized today in Cape Town. The Ingvar Kamprad Chair of Extreme Environments will be supported by Ferring Pharmaceuticals and based at EPFL's Valais-Wallis outpost in Sion. The new team will work in EPFL's alpine and extreme environment research center. It will apply cutting-edge scientific and technological solutions to environmental challenges like [climate change](#) and global resource management. This approach will enhance Switzerland's existing scientific, economic and diplomatic contribution to this effort.

More information: Regular updates on the ACE expedition will be available here: spi-ace-expedition.ch/

Provided by Ecole Polytechnique Federale de Lausanne

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