

Explore Antarctica

Antarctica, the continent that surrounds the South Pole, remains the most mysterious continent on Earth. It is less than 200 years since the first person set foot on Antarctica. Since then, small numbers of explorers and scientists have been visiting the world's coldest continent. No-one lives there permanently.

Among the visitors have been several thousand South Africans, working on and studying the continent and the surrounding Southern Ocean islands:

- Prince Edward Island and Marion Island, which are two peaks of a volcano that belong to South Africa; and
- Gough Island, a British protectorate, which is largely uninhabited except for the eight to ten South Africans and British nationals who man a meteorological station (studying the weather) there.

Although the region is harsh and very few people live there, it is very vulnerable. Much of the South African researchers' work in the Antarctic and Southern Ocean Islands region is aimed at protecting the fragile environment. The mission of the South African National Antarctic Programme (SANAP) is to increase our understanding of the natural environment and life in the area through appropriate research, science and technology.

Who owns Antarctica?

The Antarctic continent does not belong to any state or government. South Africa and 44 other member nations belong to the Antarctic Treaty, which determines how the area is managed. Countries who sign this treaty undertake to ensure that the Antarctic region will only be used for peaceful and scientific purposes and to protect and preserve the environment.





Humans in Antarctica

- 350 BC:** Early Greeks decide there should be a landmass in the south to counter the weight of the Arctic. They call this land Antarctica, meaning opposite the Arctic.
- 1773:** Captain James Cook circumnavigates the Antarctic and is the first to cross the Arctic Circle.
- 1819:** Fabian von Bellingshausen becomes the first person to see the Antarctic continent after crossing the Arctic Circle.
- 1820:** Captain John Davis, on a sailing expedition, reports the first landing on the continent of Antarctica.
- 1823:** British whaler James Weddell sails to 74 degrees South, which is the furthest most south sailed. The Weddell Sea is named after him.
- 1840:** British, French and American expeditions establish status of Antarctica as a continent.
- 1899:** Carsten Borchgrevink leads a British expedition that lands men at Cape Adare. This is the first expedition team to spend a winter in Antarctica.
- 1911:** Norwegian Roald Amundsen, along with four other expedition members, discovers a new route that leads to the South Pole.
- 1923:** The beginning of large-scale factory-ship whaling in the Ross Sea.
- 1928:** Sir Hubert Wilkins makes the first Antarctic flight from the Antarctic peninsula to the Ross Sea.
- 1935:** Caroline Mikkelsen from Norway becomes the first woman to land on Antarctica.
- 1961:** The Antarctic Treaty governing activities in Antarctica is signed. South Africa is one of the original signatories of this Treaty.

Climate

- Antarctica is the coldest, windiest and driest place on Earth. It is almost entirely covered in ice. The lowest temperature measured was -88 degrees Celsius. In the interior, wind speeds reach up to 350 km/h. The annual rainfall is about 50 mm inland and 35 mm along the coast (South Africa's average annual rainfall is 464 mm, and the world average is 857 mm).
- During summer, Antarctica has 24-hour days and no nights. During winter, Antarctica has 24-hour nights when it is continually dark for about one month.
- Antarctica is so cold because it is:
 - ◆ surrounded by an ocean with cold currents;
 - ◆ the windiest place on Earth;
 - ◆ completely covered with snow. Since snow is white, it reflects rather than absorbs the Sun's rays; and
 - ◆ situated at an extremely high altitude (average 2 500 m).

Indigenous plants and animals

Antarctica is a hostile environment and most of the plants and creatures in South Africa will not survive there. Lichen – a plant composed of fungus and algae – is found on the rocky outcrops. Invertebrates (animals without backbones) such as ticks and mites are also found there. Larger land animals include penguins and seals. The surrounding ocean is the home of whales, which feed on krill and sometimes seals and penguins. A few bird species are also found on Antarctica.

South Africa in Antarctica

South Africa's involvement in Antarctica and the Southern Ocean Islands dates back to the earliest voyages of discovery, due to the then Cape of Good Hope's position as a stop-over for explorers, whalers and sealers (people hunting whales and seals).

After World War II, South Africa became more formally involved in this region. Our researchers undertook meteorological expeditions to the Prince Edward Islands. A permanent weather base was established on Marion and South Africa annexed the islands in 1948.

In 1959, the first South African National Antarctic Expedition (SANAE) was undertaken. The expedition established a permanent presence for South Africa on Antarctica that is still there today. The South Africans took over an abandoned Norwegian base on the edge of the ice shelf, some 4 000 km south of Cape Town. This base was replaced several times, because a base built on the ice shelf drifts out to sea with the ice with time and is eventually covered with snow.

The South African base was then moved 170 km inland. The current SANAE IV was built on a rocky outcrop peeping out of the white snow. The new base was completed in 1997.



The frame of the base is made of steel and the outer layer is rigid, pre-constructed foam and fibreglass panels. The base is built on stilts to allow for wind flow and to prevent the accumulation of snow. The roof and bottom panels are painted bright orange which makes it easier to see the base from the air.

The living quarters are heated by heat exchangers that are run off a generator. Fresh water is obtained by melting snow.

How to get there

Antarctica is 4 000 km away from South Africa. It takes 40 days to travel there by ship. It can only be reached between November/December and April/May.

The SA Agulhas is the South African government's research and supply ship which is used to transport people and cargo to its three bases in Antarctica and on Marion and Gough Islands. Other countries also charter the Agulhas to assist with their Antarctic programmes.

Research is conducted, weather observations are made and weather buoys released from the ship. The Agulhas uses satellite navigation to plot its way from South Africa to the three bases. The ship has a large hangar that houses helicopters used for air support when people and cargo are offloaded at all three stations.

Scientists in Antarctica

The South African National Antarctic Programme plays a big role to conserve Antarctica, which is considered a living laboratory. Studies done in Antarctica help us to understand the entire Earth system. Signals that researchers pick up in Antarctica tell us more about global changes in the past, as well as possible future changes.

Physical science

Physical science is the study of non-living things. It includes physics and chemistry. Physical science research is conducted all year round in Antarctica. Experiments include a network of high-frequency radars used to study the Earth's ionosphere; observing geospace (the area of space that surrounds Earth) from Earth; research on cosmic rays (very high energy charged particles from the cosmos); and observations of the magnetosphere.

Ndivhuwo Netshilaphala and Zipho Buwo doing research on Marion Island.





Studying the oceans

Oceanography is the scientific study of oceans, including their chemistry, biology and geology. Studying the oceans south of Africa contributes to our understanding of the weather and climate of southern Africa. Biodiversity in Antarctica and the islands and the Southern Ocean provide exciting research opportunities.

Engineering science

Engineers do research into how South Africa can ensure a sustainable presence in Antarctica. They study energy and waste management, wind energy, reducing air pollution, heating and ventilation of the bases, and improving the living conditions at the bases.

Who can go?

SANAP opens doors to many careers, including:

- Researchers in the fields of geospace, geology, climatology, biodiversity, engineering, physics, biology, history, sociology, politics and international relations, as well as literary studies, visual arts, cultural studies and law
- Diesel mechanics
- Medical doctors, medical orderlies and nurses
- Meteorology technicians
- Field assistants
- Radio/electronic technicians
- Electrical, electronic and mechanical engineers
- Industrial technicians.

Comments from a few who have been there

"I got involved in SANAP to do science at the end of the world."

Tankiso Modise, physicist, CSIR.

"The rare opportunity to visit Antarctica teaches one a great deal and helps you appreciate things back home that most people overlook, such as a rainy day."

Avinash Bisnath, geologist, University of Cape Town.

"Antarctica teaches young people a unique style of self-reliance and personal management, to become dynamic scientific leaders in society."

Harm Moraal, physicist, Northwest University.

"What I like most about working in Antarctica are the high seas, icebergs and storms! It's magnificent and a privilege to be there."

Isabelle Ansoorge, oceanographer, University of Cape Town.

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