

The Polar Stern The EPICA Project

English version:

TC in: 00:03:00:00

TC out: 00:09:52:06

Duration: 00:06:52

TC in: 00:03:00:00

VOICE OFF

We're headed full south.

Welcome to Antarctica. Over there, in the distance is the Polarstern, the star vessel of European polar research. Today, the ship is unloading men and equipment for a new ice coring campaign under the Epica project. December to February is summertime in Antarctica. At -30°C temperatures are milder during this season. Scientists take advantage of this to join Dronning Maud Land, one of the two sites occupied by Epica.

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Under the impetus of the European Commission, Epica groups researchers and institutions from Belgium, the Netherlands, Denmark, France, Germany, Italy, Norway, Sweden, Great Britain and Switzerland.

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This immense ice cap interests them in more than one capacity. First of all, because this ice is the coldest and oldest on the planet. Secondly, because from the standpoint of the history of the climate, ice is an excellent source of records.

TC in: 00:04:27:03

ITV Heinrich MILLER 1

Coordinator European Project For Ice Coring in Antarctica (Epica)

AWI – Germany

Ice gives a remarkable record of the climate because the ice matrix records temperatures of the past, as well as modifications in the conditions of the environment such as major volcanic events by means of the aerosols trapped in it. In addition, it allows the measurement of changes in biological activity in the oceans of the world.

TC out: 00:04:55:20

VOICE OFF

So the ice itself gives a great deal of information. Moreover, the air bubbles trapped in the cores brought back to the surface are crucial for understanding the history of the atmosphere.

Tc in: 00:05:05:20

ITV MILLER 2

At a depth of about 100 m, there are only isolated air bubbles, but they are closed. So if we extract these bubbles now and analyse them, we can observe the evolution of the concentration of gases with a greenhouse effect over time – for example methane and CO2.

TC out: 00:05:28:09

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Getting to the drilling site of Dronning Maud Land is not an easy feat. From the coast where the Polarstern has landed, it takes from 9 to 14 days to cross 757 kilometres in snowcats and towing vehicles.

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Dronning Maud Land is located at 2892 metres above sea level, which means that this location offers the best guarantees in terms of accumulation of snow and ice.

TC in: 00:05:55:03

ITV MILLER 3

A core of ice extracted from the Antarctic polar cap consists of different layers of snow that fall on surface. The layer corresponding to one year is then covered by snow falling the following year. So every annual layer buries the previous layer more deeply.

When we bore down in the ice, we go through recent strata to older and older layers and we extract ice that, hundreds of thousands of years ago, fell on surface in the form of snow.

TC out: 00:06:27:19

VOICE OFF

The Epica project has two drilling sites: One in Dronning Maud Land, and the other one, Dome C, located on the East Antarctic plateau. The two drilling sites have different objectives.

TC in: 00:06:44:01

ITV MILLER 4

At Dome C, we want to extract the oldest ice possible. And we have succeeded, since we brought up an ice core 800,000 years old, which is twice as old as any previous ice core.

TC out: 00:06:54:17

VOICE OFF

The drilling campaign that began in 1996 is finished at Dome C. The objectives are reached at 3201 m by drilling an average of 30 m per day – and the same for Dronning Maud Land.

TC in: 00:07:10:16

ITV MILLER 5

At Dronning Maud Land, we wanted a high resolution ice core from the southern tip of the Atlantic, to study the relationship between the northern hemisphere and the southern hemisphere over time.

TC out : 00 :07 :23 :02

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Starting in 2000-2001, the drilling has now reached a level of 1551 m at Dronning Maud Land. The earth's surface is located at 2760 m.

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The deep ice core drill was developed by the University of Copenhagen (Denmark) and the Alfred Wegener Institute in Bremerhaven (Germany). Epica drilling in Dronning Maud Land is not yet complete. It will continue for the next two years. Technically speaking, for the research team it is important for the drill to go down vertically without deviating. The scientists can verify that during the drilling process by measuring the angle with a sensor inside the drill. But that's not all ...

TC in: 00:08:10:02

ITV MILLER 6

We also measure the distance between the grooves on the ice core left by the blades of the drill head. If the distance between the grooves varies, we know that we have one of several problems, which often lead to the drill not going down vertically. In this case we need to adjust the drill head.

TC out: 00:08:29:18

VOICE OFF

When the ice cores are brought back to the surface, they are recovered and submitted to a series of tests at Dronning Maud Land. Here, the ice is being dated by counting the various layers. The difference between the winter and the summer periods is visible in the light. Electrical conductivity tests are also done. These give information on periods of high volcanic activity in the southern hemisphere, for example.

TC in: 00:08:56:16

ITV MILLER 7

We want to answer the question about knowing the relationship between the northern and southern hemispheres during natural climatic changes. Does Antarctica react first or at the same time as what is happening in the northern hemisphere? Thanks to Epica, we can answer these questions and significantly improve our understanding of the climatic system and its operating models.

Tc out: 00:09:29:00

VOICE OFF

Today, the ice in Antarctica has not yet revealed all its secrets. The cores have been shipped to Europe and are now being meticulously analysed by scientists involved in

the Epica project, so as to better decode these amazing records of the climatic environment in the past.

Tc out: 00:09:52:06

International version

TC in: 00:11:00:00

TC out: 00:17:52:06

Duration: 00:06:52

B-ROLL:

TC in: 00:19:00:00

TC out: 00:41:06:08

Duration: 00:22:06

00:19:00:00

Interviews of Heinrich Miller

00:22:34:00

Polar stern and unloading crew + material

00:24:43:20

Snowcats

00:24:55:13

Arial view of helicopter

00:25:55:16

Drill process

00:27:24:06

Exterior shots

00:29:31:20

Drill process

00:35:50:22

Preparation of drilling head

00:39:43:14

Ice analysis

TC out: 00:41:06:08