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## **ESF's European ice core project EPICA receives prestigious Descartes Prize**

The research project EPICA (European Project for Ice Coring in Antarctica), one of the European Science Foundations most successful and longest running Research Networking Programmes, is one of this year's winners of the Descartes Prize for Research. The Descartes Prize for Research was awarded to three European teams for outstanding transnational projects in natural sciences and humanities by the European Union on 12 March in Brussels. The EPICA project - carried out by twelve partners from ten European nations - was successful in retrieving past climate records of great impact for the assessment of our current climate change. Temperatures and greenhouse gas concentrations over up to the last 800,000 years could be measured. The results have shown, inter alia, that the recent rise in greenhouse gas concentration is beyond any historical comparison, leading to climate change at an unprecedented rate. In addition, the ice cores allowed scientists to study in detail the coupling of the northern and southern hemisphere.

"The prize has come at a very important time as we are currently in the International Polar Year (IPY)," said Paul Egerton, Head of the European Polar Board at the European Science Foundation. "The main aspect of the IPY is to bring science to the public and this prize will help to give more visibility to climate change," continued Egerton.

The EPICA project brought together scientists from ten European nations including Belgium, Denmark, France, Germany, Italy, the Netherlands, Norway, Sweden, Switzerland and the U.K. with expertise in different branches of ice core research and glaciology.

"Only in such close collaboration between all European working groups has it been possible to carry out such a large-scale project logistically and scientifically", said Hubertus Fischer, glaciologist at the Alfred Wegener Institute, who coordinated the EPICA application for the Descartes Prize. "Especially for young scientists and students, EPICA is a unique possibility to perform top-level research together with colleagues from all over Europe and to establish their own scientific career. With the Descartes Prize we can intensify this tight networking and the close collaboration even further", added Fischer.

During its duration EPICA succeeded to retrieve two deep ice cores from the 3000 meter thick East Antarctic Ice Sheet over several years in remote regions far from any coastal research stations. Drilling operations took place under extreme climatic conditions at Dome C at 75°06'S, 123°24'E with a mean annual temperature of - 54.5 °C. The second drilling was carried out by the Alfred Wegener Institute in Dronning Maud Land at 75°00'S, 0°01'E and a mean annual temperature of - 44.6°C. After retrieval, the ice cores were shipped in frozen state to Bremerhaven, where they were cut and analysed in the various European laboratories and compared to Greenland counterparts.

Based on the EPICA ice cores it was possible to measure temperature and precipitation rates, atmospheric aerosol composition, solar activity, the flux of extraterrestrial dust onto the Earth as well as atmospheric greenhouse gas concentrations of the past. The results show that the concentrations of the greenhouse gases carbon dioxide, methane and nitrous oxide have never been as high over the last 650,000 years as today, when human activities artificially emit those gases into the atmosphere.

"We are out of the natural bounds with anthropogenic forcing. Due to human made emissions today, methane concentration is 150% higher than the natural methane concentration would be," said Fischer.

The carbon dioxide level in the past is tightly coupled to temperature changes in the Antarctic, respectively the Southern Ocean. Among others, warm periods prior to 450,000 years before present exhibited lower temperatures and greenhouse gas concentrations than our current warm period, the Holocene. Also the temperatures during the last ice age show this connection, where

slower climate changes in the Antarctic are tightly coupled with rapid climate shifts in the North Atlantic region. This connection is caused by the oceanic heat transport between the North and South Atlantic. All these results have an important bearing on the ability to predict future climate more accurately and, in particular, to assess the impact of anthropogenic effects.

This is the second time that Europe's top annual science award goes to a project co-funded by the ESF. In 2005, the European Social Survey, which also originates from an ESF Research Networking Programme, received the Descartes Prize for its radical innovations in cross-national surveys.

ESF Research Networking Programmes lay the foundation for nationally funded research groups to address major scientific and research infrastructure issues, in order to advance the frontiers of existing science. These long-term programmes, subject to selection through an open call and an international peer review process, must deal with high-quality science and demonstrate the added value of being carried out at the European level.

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