

Claude Lorius

Director Emeritus of Research at the Centre National de la Recherche Scientifique (CNRS), Grenoble

2001 Balzan Prize for Climatology

For his outstanding activities and innovative results in the field of polar paleoclimatology.

Institution Administering Funds: CNRS, Grenoble

Adviser for the Balzan General Prize Committee: Enric Banda

Research on the Mechanisms Governing the Climate System

Global climate change has become a pressing topic of scientific research. The central problem is explaining the causes of the increase in temperature and its potential effects. The study of this problem is extremely complex because of the many factors that can contribute to global warming, whether natural or related to human activity. Thus, an analysis of the history of thermal evolution of the surface of the earth is fundamental in distinguishing between changes that are “physiological” and those caused by human activity.

One of the most important methods of inquiry into past climate change is the study of polar ice, which is a natural laboratory preserving a “historic memory” of climate changes. Claude Lorius and his group worked for decades on this issue. They were the first to reconstruct not only the history of the Earth’s climate by analyzing polar ice, but also that of the composition of the atmosphere, derived from the analysis of air bubbles that were trapped in the ice over hundreds of thousands of years. Research was carried out in particular on ice samples taken in proximity to Lake Vostok in Antarctica. Their research allowed them to establish the causal relationships between climate and content of greenhouse gases in the atmosphere.

In this context, Claude Lorius initially planned to finance three projects with the second half of the Balzan Prize, but in actual fact was also able to finance a fourth. The

four groups of young researchers, each led by a senior researcher, presented their results in March 2008.

Project I

Antarctic Palaeo-temperatures and Antarctic climate mechanisms: cross-use of water isotopes (δD , $\delta^{18}O$) and air isotopes ($\delta^{15}N$, $\delta^{40}Ar$)

Senior Researcher: Jean Jouzel

Project II

Climate and atmospheric chemistry: Constraints due to isotopes of oxygen and sulfur

Senior Researcher: Joel Savarino

Project III

Study of impurities in the ice: aerosols and organic content

Senior Researcher: Jean Robert Petit

Project IV

Record of atmospheric CO₂ during Stage 11, 400,000 years ago

Senior Researcher: Dominique Raynaud

Publications:

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