



Coupling Greenhouse Gases and Climate History

*Professor Dominique Raynaud, Jai Chowdhry Beeman, Frédéric Parrenin
Univ. Grenoble Alpes, CNRS, IRD, IGE, F-38000 Grenoble, France*

During the 4.5 billion year long history of our planet, atmospheric greenhouse gases have been part of the cornucopia filled with different processes able to significantly participate in the evolution of the Earth's climate. At the beginning of our climate history, CO₂ and CH₄ likely contributed to keep the planet warm, when solar brightness was 30% weaker than today. It is also plausible that the appearance of large continental areas around 3 billion years ago allowed, through weathering processes, the development of a large atmospheric CO₂ sink, with the consequence of initiating the first known glaciation. We could also mention the hypothesis of accumulating CO₂ in the atmosphere, which led to the end of the "Snowball Earth" (800-600 million years ago). Those are a few examples of the possible roles of greenhouse gases for explaining what we call paradoxes in the ancient climates of our planet.

Focussing on more recent past times, like the latest climatic cycles, which have accurately dated paleoclimate records and much more robust proxies, allows us to evaluate proposed hypotheses of drivers of the carbon cycle and climate. Concerning greenhouse gases, atmospheric CO₂ and CH₄ are directly recorded in the air bubbles enclosed in ice sheets and particularly in Antarctic ice. These records are of global significance. The presentation will focus on the last deglaciation which occurred from 18,000 to 11,000 years ago and which is the most recent large climatic variation of global extent. Based on new results obtained on Antarctic temperature and atmospheric CO₂ records we will discuss their complex coupling during the last deglaciation. We will show how they help to refine our understanding of how CO₂ acted as an amplifier of the deglacial warming.

Organising Committee:

119017, Staromonetny pereulok 29, Moscow, Russia
Phone: +7(495)959-00-22
Fax: +7(495)959-00-33

URL: <http://100igras.ru/>
E-mail: igras100@igras.ru