

**Venerdì 24 Aprile 2020**

Ore 14.30

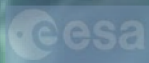
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# Atmospheric CO<sub>2</sub> and climate over geological time scales

*Vanni Aloisi*

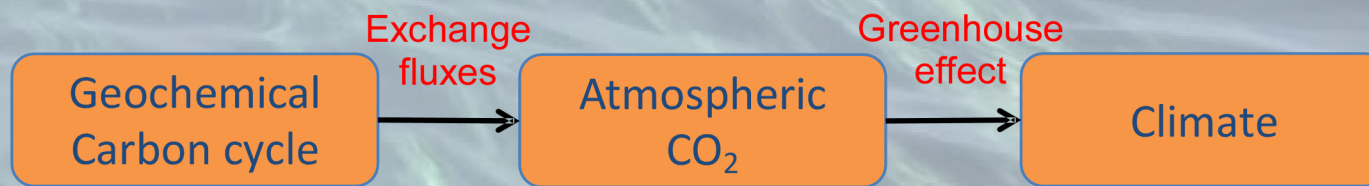
(Institut de Physique du Globe de Paris, France)





# The abstract

Carbon is essential to life on Earth. It is a major constituent of biomass, and most of the chemical energy needed for life is stored in organic compounds as bonds between carbon and other atoms. Carbon is also a fundamental constituent of the inorganic earth; it is present in the atmosphere as gaseous carbon dioxide ( $\text{CO}_2$ ), in the ocean in various dissolved forms ( $\text{CO}_2$ ,  $\text{HCO}_3^-$ ,  $\text{CO}_3^{2-}$ ), in the crust as carbonate minerals (mainly  $\text{CaCO}_3$ ) organic matter and kerogen and in the mantle as diamond and graphite. The cycling of these carbon species through the different reservoirs of the geological carbon cycle influences long-term climate change via the greenhouse effect. In this talk I will present an introduction to proxies and models of the long-term carbon cycle and will show how Earth's climate has changed in parallel with its biological and geological evolution. The processes controlling the distribution of carbon between the interior of the Earth, the lithosphere, the hydrosphere and the atmosphere will be introduced and integrated quantitatively into the GEOCARB numerical box model developed by Robert Berner that simulates the evolution of the Carbon cycle on the multi-million year time scale. Sensitivity tests will give an intuitive understanding of the relative importance of volcanism, continental weathering processes and the evolution of land-plants in controlling long-term climate change.



# The speaker

Vanni Aloisi is a geochemist at the Institut de Physique du Globe in Paris (IPGP, France). He has earned a PhD in isotope geochemistry at the Université Pierre et Marie Curie (Paris, France) in 2000 and worked at the Max plank Institute of Marine Microbiology (Bremen, Germany), the GEOMAR (Kiel, Germany), the University of Lyon (France) and the Université Pierre te Marie before joining the IPGP in 2018. His main interest is in using stable isotopes of C, O, H and S to investigate the interaction of life with geochemical processes. He currently leads the European Training Network SALTGIANT, dedicated to understanding the world most recent and one of the largest salt deposits on Earth: the Messinian Mediterranean Salt Giant.

