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DIPARTIMENTO DI GEOSCIENZE

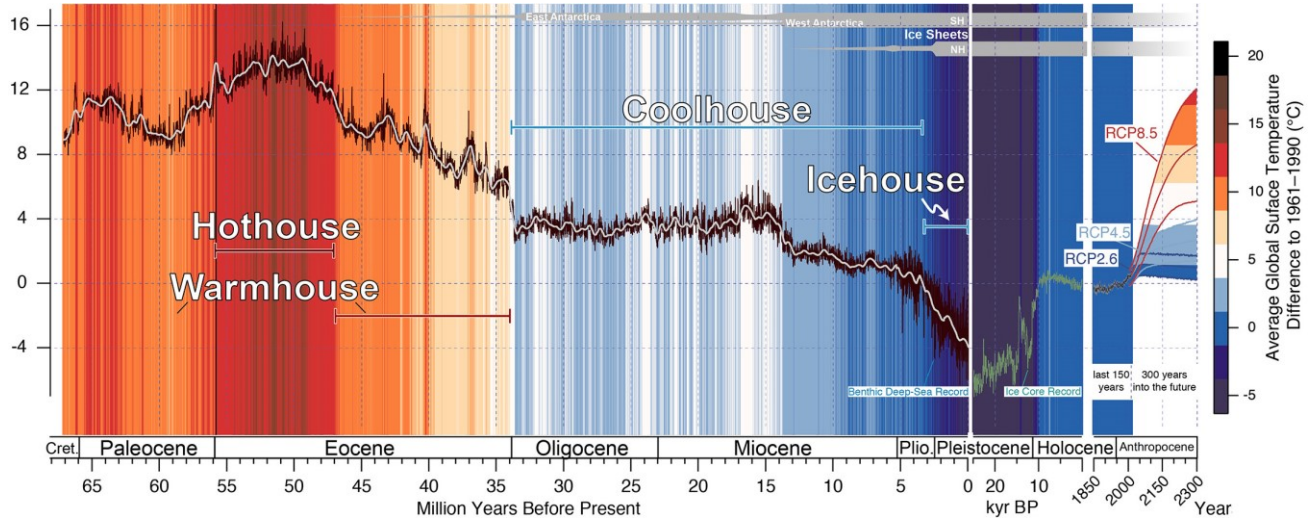
How to capture 66 million years of natural climate variability?

Thursday, 26 November 2020 – 16:30

Webinar "Live" on-line at Zoom link:
https://unipd.zoom.us/j/82978693795?pwd=TmlBSDBVRFVNL3NwTUpGSW8rWFdpQT09

Speaker: **Dr. Westerhold Thomas**

MARUM - Center for Marine Environmental Sciences (Bremen University)



Abstract

In 1954 Cesare Emiliani, the pioneer of Paleoceanography, published a paper in Science entitled Temperature of Pacific bottom waters and polar superficial waters during the Tertiary. Based on the groundbreaking work of Harold Urey, Cesare Emiliani, Samuel Epstein and others it became clear that the tests of deep-sea benthic foraminifera harbor precious information of past environmental conditions. The method of oxygen isotope analysis allowed to estimate average temperatures of the distant past. Combined with precise stratigraphy it revealed that changes in Earth's climate on time scales of 10 thousand to 1 million years was driven by quasi periodic variations in Earth's orbit around the Sun – as predicted by Milutin Milankovitch a hundred years ago.

66 years later, after hundreds of international scientific ocean drilling expeditions, we know that the best evidence for changes in Earth's climate comes from sediment at the bottom of the ocean. These are some of the only continuous archives to extend back hundreds of millions of years. Already in 1975 Shackleton and Kennett produced one of the first deep-sea benthic foraminifer stable isotope records of the Cenozoic Era - the last 66 million years. Despite its low resolution it revealed that Earth's overall climate transitioned from a 'hothouse', when no continental glaciers exist, to an 'icehouse', a period when there were ice sheets on both poles. But to be able to capture the Cenozoic natural climate variability on the finer-scale of Milankovitch cycles it took another 45 years.

In the Seminar I will discuss the latest Cenozoic climate record, how it was constructed and what the major implications are.

Proposer: **Prof. Claudia Agnini**