# C<sup>4</sup> WORKSHOP CLIMATE CHANGE AND CARBON CYCLE

## **June 22-24, 2022** CNR Research Area Pisa, Italy

Global Change from the Deep Past to the Anthropocene



The International Workshop"Climate Change and Carbon Cycle" C<sup>4</sup> aims to foster knowledge and cross-disciplinary exchange within the scientifc communities interested in Global Change, the Climate System, and the Carbon Cycle through time.

The workshop welcomes contributions on reconstructions, observations and modelling from the geosphere, atmosphere, oceans, and ecosystems, aimed to provide insights into how climate change affects the ways that carbon moves through Earth's environment from the deep past to the modern era, and how carbon cycle interacts with climate and environmental systems.

The workshop will be structured around 3 highly interdisciplinary scientific sessions Each session integrates different scientific perspectives and encompasses a wide temporal range, from the million-year scale of geological processes, through the thousand-year scale of the orbitally-driven and sub-orbital climate changes of the Quaternary, to the yearly (and sub-yearly) scale of modern monitoring and observations.

#### Processes:

This session aims to provide a better understanding of how linear and

non-linear feedbacks within the carbon cycle operate to modulate climate. We welcome contributions on fundamental processes affecting different compartments of the climate system through time. **Keynote speaker:** Marie Edmond (University of Cambridge, UK)

#### Impacts:

This session seeks to analyse the expression of global changes linked to climate and the carbon cycle on different components of the Earth System across multiple time scales, utilizing multi-disciplinary approaches. **Keynote speaker:** Richard Sanders (National Oceanography Centre, UK)

#### Frontiers:

This session aims to explore the frontiers in analytical and scientific research on carbon cycle-climate system dynamics, to identify common/ trans-scale knowledge gaps, and to stimulate discussion on how an integrated approach can push research boundaries.

Keynote speaker: Bärbel Hönisch (Lamont-Doherty Earth Observatory, USA)

#### Exchanges will be also fostered through 3 interactive cross-disciplinary laboratories:

#### **Observation and Prediction:** two sides of the same coin

This laboratory aims to provide an introduction to the coupling between observational datasets (by using the dataset produced by ICOS-RI as "textbook" example) and vegetation numerical modelling for carbon cycle investigations.

### **Discovering the Deep**

In this laboratory we will present the International Ocean Discovery Program (IODP) that is the longest international marine research collaboration that explores Earth's history and dynamics. Three unique replicas of ODP and IODP drilled cores recording critical paleoclimatic events through geological history, will be displayed during this laboratory. rants for Early Career Scientists d for scientists from developin

**REGISTRATION AND** 

ABSTRACT SUBMISSION:

from December 13<sup>th</sup> 2021 to

April 30<sup>th</sup> 2022

https://dta.cnr.it/climatechange-and-carbon-cycle/

#### Walking through the Earth System

Three laboratories will walk you through the understanding of the Earth from different perspectives (surface to deep), matrices (air, water, vegetation, soil and rocks), and time scales (minutes to millions of years). In each laboratory, you will have a glimpse of the practical and challenging aspects of the researches on these topics, taking part in an interactive experience.

C<sup>4</sup> Workshop is promoted and organized by the Working Groups "Paleoclimate dynamics" and "Carbon Cycle" of the National Research Council of Italy.