

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

Global Change from the Deep Past to the Anthropocene

**June 22-24, 2022**

CNR Research Area  
Pisa, Italy

## Day 1 – Wednesday, June 22

12:30 Registration

13:40 Greetings and workshop introduction (Chiara Boschi)

13:45 C cycle: from the Anthropocene to the Deep Time (Fabio Trincardi)

### Session - Processes

Auditorium

Chaired by: Paolo Montagna and Paolo Cristofanelli

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- 14:00 Keynote: Marie Edmonds  
**Volcanoes, the geological carbon cycle and catastrophic perturbations in deep time**
- 14:30 Invited speaker: Ana Bastos  
**Climate extremes and the carbon cycle: impacts, cascading effects and feedbacks**
- 14:45 Cascone M.\*, Bastianoni A., Selci M., Correggia M., di Iorio L., Cordone A., Barry P., Lloyd K., Jessen G., Chiodi A., de Moor M., Nakagawa M., Ramirez C., Schrenk M., Giovannelli D.: **Deeply-sourced springs of the Argentina backarc as windows into the subsurface.**
- 15:00 Cantoni C.\*, Caruso V., Cozzi S., Hopwood M.J., Mas S., Voron F., Luchetta A., Vidussi F., Mostajir B.: **The Role of freshwater sources and river freshets on carbonate chemistry: differences in Arctic and Mediterranean Coastal Zones**
- 15:15 Donnini M.\*, Marchesini I., Zucchini A.: **The role of carbonate weathering in the global carbon cycle. The case study of Alps**
- 15:30 Mastropiero M.\* and Zanchettin D.: **Carbon cycle responses in the Amazon region to large scale climatic modes of variability**
- 15:45 Mancini A.M.\*, Lozar F., Bocci G., Morigi C., Gennari R., Negri A.: **Organic carbon accumulation in the Mediterranean Sea in response to deoxygenation event in the geological history: toward constraining future impacts**
- 16:00 **COFFEE BREAK (16:00-16:45)**
- 16:45 Traversi R.\*, Becagli S., Caiazzo L., Nardin R., Severi M., Calzolari G., Chiari M., Giardi F., Nava S., Pazzi G., Lucarelli F.: **Organic and inorganic Carbon species in atmospheric aerosol as markers of anthropic inputs: a focus on urban areas in Tuscany** (Solicited talk)
- 17:00 Bastianoni A.\*, Cascone M., de Moor M.J., Price R., Barry P., Cordone A., Giovannelli D.: **The Carbon Cycle is Missing a Piece: Shallow-Water Hydrothermal Vents Contribution to Global CO<sub>2</sub> Fluxes**
- 17:15 Salvadori M.\*, Scartazza A., Baneschi I., Adamo M.P., Pennisi M., Gavrichkova O., Sella L., Botteghi S., Brugnoli E., Fuina S., Maerker M., Mattioni M., Ragazzi E., Richiardi C., Rossi V., Rota F., Tarantino C.: **Combining bio-geochemistry, remote sensing and social sciences to assess the effects of land use change within the CZ framework: the ABRESO project**
- 17:30 Magnani M.\*, Baneschi I., Giamberini M.S., Lenzi S., Mosca P., Raco B., Provenzale A.: **Models of carbon dioxide fluxes in the Alpine and Arctic Critical Zone** (On line)
- 17:45 **POSTER PRESENTATIONS (17:45-18:30)**. See poster details on page 4
- 18:30 **APERIO-POSTER (18:30-20:00)**

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## Day 2 – Thursday, June 23

Session – Impacts

Auditorium

Chaired by: Irene Cornacchia and Eleonora Regattieri

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- 09:00** Keynote: Richard Sanders  
**Which C ocean cycle can we expect in the future?**
- 09:30** Invited Speaker: Nehrbass-Ahles Christoph\*, Silva L., Schmitt J., Fischer H., Stocker TF.  
**Centennial-scale atmospheric CO<sub>2</sub> features: A new constraint for carbon cycle modelling?**
- 09:45** Nogarotto A.\*, Noormets R., Chauhan T., Colleoni F., Mollenhauer G., Muschitiello F., Capotondi L., Pellegrini C., Belt S., Tesi T.: **Terrestrial biomarkers in sediments from northern Svalbard reveal unprecedented subglacial meltwater drainage during the Last Termination**
- 10:00** Bordiga M.\*, Cobianchi M., Cerino F., Cabrini M., Beran A., Lupi C.:  
**Living and fossil *Helicosphaera carteri* under low and high CO<sub>2</sub> levels: a tool to study past (Last Interglacial) and future climate and carbon cycle**
- 10:15** **COFFEE BREAK (10:15-11:00)**
- 11:00** Provenzale A. and the IGG CZ Collective: **Carbon and the Critical Zone** (Solicited talk) (On line)
- 11:15** Santinelli C.: **Evidence of Covid-19 lockdown effects on riverine dissolved organic matter dynamics provides a proof-of-concept for needed regulations of anthropogenic emissions** (Solicited talk)
- 11:30** Falzoni F.\*, Montanaro A., Iannace A., Parente M.: **New insights into timing and causes of the End Triassic Extinction in southern Tethyan carbonate platforms**
- 11:45** Yu Z: **Global peatland dynamics: response to climate change and impact on the global carbon cycle**
- 12:00** Gariboldi K.: **Hidden forests: mat-forming diatoms in the geological time**
- 12:15** **LUNCH-POSTER (12:15-13:45)**
- 13:45** D'Incecco S.\*, Baneschi I., Lelli M., Raco B., Provenzale A., Pennisi M.: **Investigating the carbon biogeochemical cycle at Mt. Etna**
- 14:00** Montanaro A.\*, Falzoni F., Iannace A., Adatte T., Parente M.: **Mercury anomaly as a proxy for volcanism in an isolated carbonate platform during the end-Triassic mass extinction**
- 14:15** Dasgupta B.: **The Leaf-Wax Carbon Isotopes in the Urban World: Revisiting Climate-Isotope Relation Under Changing Land-Covers** (On-Line)
- 14:30** **LABORATORIES (14:30-18:00)**. See Laboratories details on page 5
- 16:00** **COFFEE REFILL (16:00-17:00)**

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## Day 3 – Friday, June 24

Session – Frontiers

Auditorium

Chaired by: Chiara Boschi and Tommaso Tesi

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- 09:00** Barbante C.: **Beyond EPICA - Oldest Ice Core. The European Effort to Obtain A 1.5 Myr Greenhouse Gas – Climate Feedback Record from an Ice Core in East Antarctica** (Solicited talk)
- 09:15** Invited speaker: Höning Dennis\*, Willeit, M., Ganopolski A.  
**Impact of carbon emissions on ice sheet stability and towards understanding feedbacks with the biosphere**
- 09:30** Melnikova I.\*, Boucher O., Tanaka K., Vuichard N., Ciais P.: **Impacts of afforestation and bioenergy crops on the global land carbon sink**
- 09:45** Koren G.\*, Adnew G.A., de Boer H.J., Boersma F.K., Cho A., Dekker S.C., Faassen K.A. P., Kooijmans L.M.J., Krol M.C., Lujckx I.T., Wouter P., Rebel K.T., Röckmann T.: **New constraints on gross primary production from atmospheric tracers and remote sensing proxies**
- 10:00** Rielli A.\*, Boschi C., Dini A.: **Carbon off the beaten track: hydrothermal carbonates reveal concealed CO<sub>2</sub> routes through the Earth's crust**
- 10:15** **COFFEE BREAK (10:15-11:15)**
- 11:15** D'Alcalà R. and Gruppo di Lavoro sul Ciclo del Carbonio: **The evolution of Carbon cycle in the Mediterranean region: from the Pliocene to the Anthropocene** (Solicited talk)
- 11:30** Gavrichkova O.\*, Pallozzi E., Brugnoli E., Augusti A.: **Herbivore-plant-microbial interactions in permafrost and high altitude lands** (Solicited talk)
- 11:45** Marino G.: **Traditional and novel approaches to tackle the Mediterranean organic-rich layers** (Solicited talk)
- 12:00** **LUNCH-POSTER (12:00-14:00)**
- 14:00** Keynote: Bärbel Hönlisch  
**Towards a CO<sub>2</sub> 'Keeling Curve' for Geologic Time** (On line)
- 14:30** **CONCLUDING REMARKS (14:30-15:00)**

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## POSTERS

### SESSION – PROCESSES

1. Rubino M.\*: **Isotopic investigations of carbon fluxes and their implications on the climate system**
2. Donato A., Pappaccogli G., Mazzola M., Decesari S., Famulari D.: **Turbulent methane fluxes at Arctic site of Ny Ålesund**
3. Fratticioli C.\*, Cristofanelli P., Trisolino P., Calzolari F., Bonasoni P., Calidonna C.R., Ammoscato I., Gulli' D., Contini D.: **Observation of CO<sub>2</sub> at CNR-ISAC stations and possible contributions to the study of the carbon cycle: current status and future perspectives**
4. Di Lonardo S., Pini R., D'Acqui L.P., Gardin L., Grifoni M., Scatena M., Doderò A., Mascacchi C., Bonetti A., Rosellini I., Fares S., Scartazza A.: **Organic carbon stocks and dynamics in soil profiles of a peri-urban Mediterranean forest ecosystem**
5. Scartazza A.\*, Sbrana C., Matteucci G., Rezaie N., D'Andrea E., Lauteri M.: **Carbon and nitrogen exchanges and isotope fractionations at ectomycorrhizal interface in a Mediterranean beech forest**
6. Furia M.\*, Margiotta F., Retelletti S., Santinelli C.: **Organic Carbon dynamics in a Mediterranean coastal site (LTER MareChiara Station)**
7. Ait Brahim Y.\*, Sha L., Wassenburg, J. A., Cheng H., Bouchaou L., Cruz Francisco W.: **A Terrestrial Carbon Isotope record of Green Sahara Periods during the Last Glaciation**
8. Bronzo L.\*, Bonomo S., Scateni B., Di Roberto A., Morigi C., Cascella A.: **Analysis of calcareous nanofossils associations in the NDT\_09 marine sediment core (Southern Tyrrhenian Sea) – AMUSED project, INGV: Preliminary Data**
9. Parviz N.\*: **High-Resolution magnetic susceptibility analyses applied to southern Tajikistan loess deposits during the early Pleistocene and their implication for paleoenvironmental**
10. Kumar A.\*, Balakrishna K., Udayashankar Harikripa N.: **Chemical weathering perspectives on small-coastal catchments: Implications for Carbon cycle and Climate change**

### SESSION – IMPACTS

1. Gagliardi C.\*, Pihlatie M., Koskinen M., Skogberg M., Nevalainen O., Lohila A.: **Carbon Balance of Agricultural Lands – comparison of a conventional and a Low-Cost Measurement Method**
2. Quintana C.\*, Bjune A., Seddon A.: **Carbon and ecological variability in Scandinavian peatlands during the Holocene**
3. Ruscitto V.\*, Tomassetti L., Cornacchia I., Lirer F., Cascella A., Aldega L., Catanzariti R., Trapasso F., Brandano M.: **The stratigraphic expression of MECO (Middle Eocene Climatic Optimum) in the Capo Mortola section (Ligurian Alps, Italy)**

### SESSION – FRONTIERS

1. Chiapponi E.\*, Giambastiani Beatrice M.S., Zannoni D., Antonellini M., Silvestri S.: **GHGs emissions in temperate coastal wetlands: A study of the interplay between environmental variables in the Adriatic coast (Italy).**
2. Sanna L.\*, Casula M.: **Modelling CO<sub>2</sub> dynamic in the karst critical zone**

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## LABORATORIES – DAY 2 THURSDAY, JUNE 23

1. **Observation and Prediction: two sides of the same coin** (Co-organised by ICOS-Italia, led by Alessio Collalti and Paolo Cristofanelli)
2. **Discovering the Deep** (Co-organised by IODP-Italia, led by Chiara Boschi, Annalisa Iadanza, Tommaso Tesi, Karen Gariboldi, Paolo Montagna)
3. **Walking through the Earth: a hands-on experience** (Led by Bachi G., Baneschi I., Cornacchia I., Di Giuseppe P., Gavrichkova O., Giamberini MS., Parisi A., Retelletti S., Rielli A., Salvadori M., Santinelli C., Scartazza A., Vezzoni S.)



The 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.

