CarboNetwork



All the news and opportunities from the Italian scientific community working on the Carbon Cycle





Dear All,

Welcome to the new issue of CarboNetwork, the newsletter of the Italian Carbon Network.

The political scene in recent months has been very uncertain and environmental issues are increasingly becoming a cause for global concern. Starting from 26th September 2022, due to the awful damage to the Nord Stream gas pipes, a large amount of methane – the single largest release of methane in history - has been released into the atmosphere after a series of explosions affected this infrastructure. Even if this single large release episode is likely to not have a direct significant impact to the future warming of our atmosphere, it further raises the attention to the contribution of fugitive methane emissions related to leaks in the extraction.

As scientists, we must invade political and social territory, with greater force and presence, because scientific knowledge must be the basis for all future choices. We cannot think that our society can continue this absurd race towards self-destruction.

Therefore, we again invite you to participate in building our carbon cycle science network that plays a role in society.

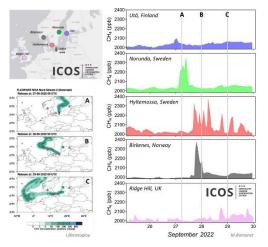
Do not forget to share your science contributing to any of the sections of the next newsletter scheduled for February 15, 2023. You can submit your contributions using the online form at the address https://forms.gle/fvEwWUYKrUQjhUicA.

Contributions arriving after the 1st of February will automatically go to the next newsletter.

Finally, we want to thank you for your support and the contributions we have received so far.

Best, CNR GdL Ciclo del Carbonio

ICOS measurements detected huge methane peaks in the atmosphere after Nord Stream leak



Due to the damage to the Nord Stream gas lines in the Baltic Sea, an enormous amount of methane gas has been released into the atmosphere. The methane emissions were detected by ICOS ground-based observations from several stations in Sweden, Norway, Finland and the UK. No obvious signals of the methane leak were detected by ICOS station in northern Italy.

Two links for further information: Media release: ICOS measurements show huge methane peaks in the atmosphere after Nord Stream leak; ICOS Data Portal.

The Carbon Cycle working group attended the ICOS Science Conference 2022



The ICOS Science Conference 2022 was held on 13-15 September 2022 in Utrecht (The Netherlands). Over 280 oral and poster presentations have been accepted and divided into 25 sessions spanning different themes related with carbon cycle study and greenhouse gas emissions. A poster ("The Group on the Carbon Cycle by CNR-DSSTTA: an interdisciplinary working group to facilitate cross-collaboration on Carbon Cycle studies in Italy") was presented by our working group to present our structure and activities to further integrate the multi-disciplinary national community dealing with the Carbon cycle in Italy.

The online book of abstract can be found at this link.

FLUXES, The European Greenhouse Gas Bulletin



The first volume of FLUXES, the European Greenhouse Gas Bulletin edited by ICOS, has been published. The focuses were on regional and year-over-year changes in carbon sinks in Europe.

Download FLUXES Vol.1

Mission Carbon Neutrality: Italian science at the forefront on Climate Neutrality



Almost 70 studies presented, over 50 research institutions represented and almost 150 participants including representatives from startups, companies and different stakeholders: the first ICOS Italy national conference was held in Rome, on September 27th and 28th. The event gathered the Italian scientific community whose work revolves around data collection and interpretation, emissions and absorption of greenhouse gases. The Conference was entitled "Mission Carbon neutrality: role, status and perspectives of environmental observations", and it was a brilliant opportunity to reunite a growing multidisciplinary and national-spreaded community, seeking

answers to a problem that can only be tackled on a global scale, but which also has a strong regional, national and local dimension. Link for further information.

Two IODP Expeditions coordinated by Italian scientists scheduled for 2024



Two IODP expeditions have been recently scheduled in 2024 to be conducted by Italian scientists. IODP Exp. 402 Tyrrhenian Continent-Ocean Transition (Co-chief Nevio Zitellini, CNR-ISMAR) will explore the evolution of the continent-ocean transition, including the presumably subsequently exhumed mantle. IODP Exp. 403 Eastern Fram Strait Paleo-Archive (Arctic) (Co-chief Renata Lucchi, OGS) will investigate how ocean system and cryosphere worked during past warmer intervals of either/both high

insulation and/or high atmospheric CO2 content, a crucial although still unknown and debated issue. Click here for the website with related references with opportunities to get involved.

Methane in the national global greenhouse gases inventory. Italy and the Global methane Pledge (ISPRA report)



In the report "Methane in the national global greenhouse gases inventory. Italy and the Global methane Pledge.", recently released by ISPRA, Italian methane emissions data are analyzed to evaluate the potential emission reduction by 2030. A state of the art of international methane emissions is also presented, to compare the actions of the US and EU countries, which are promoting the Global Methane Pledge. 122 countries are currently committed to contributing to gaining global emissions reduction by 30% by 2030, as stated in the Global Methane Pledge.

Web reference and report download.

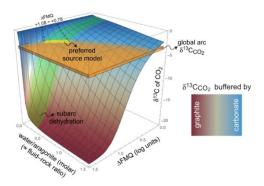
The ICDP DIVE project has started its operations!



The ICDP funded DIVE project started its operations in early October. The International project, Drilling into the Ivrea-Verbano zonE, during its phase one will be drilling two scientific boreholes in Val D'Ossola down to a depth of 1 km. Several national and international universities, institutions and research centers are part of the consortia that will explore the deep continental crust and its transition to the mantle.

Click here for further information.

Newsworthy articles



• Tumiati, S., Recchia, S., Remusat, L. et al. Subducted organic matter buffered by marine carbonate rules the carbon isotopic signature of arc emissions. Nat Commun 13, 2909 (2022)

New study on carbon sources of volcanic degassing.

Mahnken, M., Cailleret, M., Collalti, A., Trotta, C., Biondo, C., D'Andrea, E., Dalmonech, D., Marano, G., Mäkelä, A., Minunno, F., Peltoniemi, M., Trotsiuk, V., Nadal-Sala, D., Sabaté, S., Vallet, P., Aussenac, R., Cameron, D. R., Bohn, F. J., Grote, R. ... Reyer, C. P. O. (2022). Accuracy, realism and general applicability of European forest models. Global Change Biology, 00, 1–23.

Forest models are instrumental for understanding and projecting the impact of climate change on forests.

• Moran, M.A., Kujawinski, E.B., Schroer, W.F. et al. *Microbial metabolites in the marine carbon cycle*, Nature Microbiology volume 7, pages508–523 (2022).

One-quarter of photosynthesis-derived carbon on Earth rapidly cycles through a set of short-lived seawater metabolites. Although microbial-derived metabolites account for only a minor fraction of the total reservoir of marine dissolved organic carbon, their flux and fate underpin the central role of the ocean in sustaining life on Earth.

• Miner, K.R., Turetsky, M.R., Malina, E. et al. *Permafrost carbon emissions in a changing Arctic*, Nat Rev Earth Environ 3, 55–67 (2022).

Arctic permafrost stores nearly 1,700 billion metric tons of frozen and thawing carbon. Anthropogenic warming threatens to release an unknown quantity of this carbon to the atmosphere, influencing the climate in processes collectively known as the permafrost carbon feedback.

• Bouilhol, P., Debret, B., Inglis, E.C. et al. *Decoupling of inorganic and organic carbon during slab mantle devolatilisation*, Nat Commun 13, 308 (2022)

Serpentinites are an important sink for both inorganic and organic carbon, and their behavior during subduction is thought to play a fundamental role in the global cycling of carbon.

• Jian, J., Bailey, V., Dorheim, K. et al. *Historically inconsistent productivity and respiration fluxes in the global terrestrial carbon cycle*, Nat Commun 13, 1733 (2022).

Researchers have discovered that key parts of the global carbon cycle used to track movement of carbon dioxide in the environment are not correct, which could significantly alter conventional carbon cycle models.

• Yongfei Bau and Francesca Cotrufo. *Grassland soil carbon sequestration: Current understanding, challenges, and solutions, SCIENCE, Vol 377, Issue 6606.*

This paper illustrates the achievable soil organic carbon sequestration potential in global grasslands, in grazing management, and in pasturelands.

 Coppola, A.I., Wagner, S., Lennartz, S.T. et al. The black carbon cycle and its role in the Earth system, Nat Rev Earth Environ 3, 516–532 (2022).

Black carbon (BC) is produced by incomplete combustion of biomass by wildfires and burning of fossil fuels. BC is environmentally persistent over centuries to millennia, sequestering carbon in marine and terrestrial environments. However, its production, storage and dynamics, and therefore its role in the broader carbon cycling during global change, are poorly understood.

Hot off the press

- Randazzo P, Caracausi A, Aiuppa A, Cardellini C, Chiodini G, Apollaro C, Paternoster M, Rosiello A and Vespasiano G (2022). Active degassing of crustal CO2 in areas of tectonic collision: A case study from the Pollino: Front. Earth Sci., 30 September 2022 Sec. Geochemistry
- Giovannelli, D., Barry, P.H., de Moor, J.M., Jesse, G.L., Schrenk, M.O., Lloyd, K.G. (2022). Sampling across large-scale geological gradients to study geosphere-biosphere interactions. Frontiers in Microbiology
- Jannik Martens, Birgit Wild, Igor Semiletov, Oleg V. Dudarev & Örjan Gustafsson. Circum-Arctic release of terrestrial carbon varies between regions and sources. Nature Communications volume 13, Article number: 5858 (2022)
- Rielli A., Boschi C., Dini A., 2022. Tectonically driven carbonation of serpentinite by mantle CO2: Genesis of the Castiglioncello magnesite deposit in the Ligurian ophiolite of central Tuscany (Italy), Ore geology review, 149,105022
- Sun, Z.; Ma, Z.; Ma, M.; Cai, W.; Xiang, X.; Zhang, S.; Chen, M.; Chen, L. Carbon Peak
 and Carbon Neutrality in the Building Sector: A Bibliometric Review. Buildings 2022, 12,
 128
- D.Dalmonecha, G.Marano, J.S.Amthor, A.Cescatti, M.Lindner, C.Trotta,
 A.Collalti. Feasibility of enhancing carbon sequestration and stock capacity in temperate and boreal European forests via changes to management regimes. <u>Agricultural and</u> Forest Meteorology Volume 327, 15 December 2022, 109203
- Birgit Wild et al. 2022. Organic matter composition and greenhouse gas production of thawing subsea permafrost in the Laptev Sea, <u>Nat Commun 13, 5057 (2022)</u>.

Coccodrilli al Polo Nord e Ghiacci all'Equatore di Antonello Provenzale



E' tra i sei finalisti del Premio ASIMOV, l'illustre premio di cultura e divulgazione scientifica promosso dall'INFN Istituto Nazionale di Fisica Nucleare, il libro di Antonello Provenzale "Coccodrilli al Polo Nord e ghiacci all'Equatore".

A ragion veduta! Perché è un libro che spiega con chiarezza la complessità del sistema terra e la dinamica del clima, apocalittiche visioni contro 0 irragionevole scetticismo. Antonello Provenzale accompagna il lettore in un viaggio nella storia del clima della terra fino a narrare "l'ingombrante" presenza dell'uomo conseguenze. Uno sguardo lucido che affronta con realismo scientifico il prossimo futuro per lo sviluppo di una società più sostenibile e con l'auspicio di immaginare e affrontare la sfida climatica con approcci innovativi e tecnologie avanzate, lavorando con la natura e non contro di essa.

Upcoming Events



Genoa Science Festival - 20th October - 1st November 2022 - LANGUAGES. A great opportunity to meet researchers, science enthusiasts, schools, and families. The 2022 edition is devoted to the word: LANGUAGES. The

ability to invent and use complex languages is one of the unique characteristics of our species. Mathematical language, technical, symbolic, programming, musical, and artistic languages the multiple languages are essential tools for development of scientific thought. Link to the website

EGU General Assembly 2023- Vienna, Austria & Online | 23-28 April 2023.



The EGU General Assembly 2023 brings together geoscientists from all over the world to one meeting covering all disciplines of the Earth, planetary, and space sciences. The EGU aims to provide a forum where scientists, especially early career researchers, can present their work and discuss their ideas with experts in all fields of geoscience. Abstract submission from 01 Nov 2022 to 10 Jan 2023, 13:00 CET.

Website: https://www.egu23.eu

INtegrated QUAternary MArine REcords at sensitive latitudes, INQUA-MARE workshop: Arctic Realm Pisa 5-7 December 2022.



INQUA-MARE is meant to bring together scientists studying Holocene sediment records from Arctic, Antarctic, and Tropical regions, the most sensitive to climate change. The

main objective is to bring researchers together, to meet, share and discuss scientific interconnections between these areas, targeting the integration of data and knowledge on the recent evolution of the Earth's climate. INQUA-MARE was conceived to specifically involve early-career researchers (ECRs) and developing-country researchers (DCRs) to help them develop new scientific networks and collaborations with Senior Scientists. Deadline for abstract submission: 25 November 2021. For further information: e-mail karengariboldi@gmail.com (Karen Gariboldi) / Link to the pdf.

XXI Inqua Congress "A Mediterranean perspective on Quaternary Sciences", 13-20 July 2023, Sapienza University of Rome (Italy).



Abstract submission is open!

Contacts: info@inquaroma2023.org.

For detailed information on scientific sessions, please click here.

IUFRO World Congress in Stockholm 2024 - call for session proposals.



Carbon, climate change and the SDGs are central to this major forest science event.

Please visit the major congress themes and submit a session proposal at this link.

4th Carbon from Space Workshop.



TUESDAY, OCTOBER 25, 2022 (ALL DAY) TO FRIDAY, OCTOBER 28, 2022 (ALL DAY) ROME, ITALY (HYBRID MEETING).

Link to the website

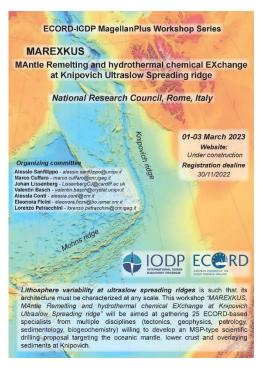
2nd workshop Arctic Cryosphere Change and Coastal Marine Ecosystems: Numerical ecology and time series analysis of marine proxy data.



Copenhagen, Denmark, 14-16 November 2022.

Link for the website

MAREXKUS MagellanPlus workshop "MAntle Remelting and hydrothermal chemical EXchange at Knipovich Ultraslow Spreading ridge", CNR, Rome, 1-3 March 2023.



In the frame of the "ECORD-ICDP MagellanPlus Workshop" Series", the "Mantle Remelting and hydrothermal chemical Exchange at Knipovich Ultraslow Spreading ridge"-MAREXKUS workshop will take place at the National research Council (CNR headquarters, Rome, 1-3 March 2023). The scientists will meet to discuss the development of a future ECORD/IODP proposal to be implemented in the Northern Atlantic, to investigate, among other goals, the geological and geochemical processes occurring at the basement-sediment interface impacting the carbon cycle. Link for the website.

Registration deadline: 30th November 2022.

Contact: Alessio Sanfilippo, alessio.sanfilippo@unipv.it

AGU Fall Meeting, 12 - 16 December 2022 - Chicago and online everywhere.



AGU Fall Meeting is the most influential event in the world dedicated to the advancement of Earth and space sciences. More than 25,000 attendees from more than 100 countries will convene to explore how Science Leads the Future.

Link for the website.

Workshop on the future of Scientific Drilling - towards an ECORD-Japan program.



An online workshop on the future of Scientific Ocean Drilling with Mission-Specific Platforms and Chikyu – Jointly organised by ESSAC and J-DESC will take place (17, 19, 26 Jan 2023, CET 09:30-12:30). Based on the new ECORD-Japan program under development, the event aims at fostering scientific collaborations among the ECORD/ Japan scientific drilling communities, presenting the state of the art of the new collaboration and future views on scientific ocean

drilling post-2024, exchanging ideas on knowledge gaps and novel scientific questions.

Link for the website, contact: ESSAC Office essac@ogs.it

Bando PRIN 2022 PNRR





The PRIN 2022 PNNR Call ("Bando PRIN 2022 PNRR") funds biannual projects on the research sectors related to the clusters of the EU's Framework Programme for research and innovation 2021-2027. The projects will be funded in the frame of the Next Generation EU Fund. The application forms will be available from the Oct 18th of

October (h 15:00) at the website https://prin.mur.gov.it/. The projects must be submitted by the deadline of November 30th, h 15:00. Official call website: https://www.mur.gov.it/it/atti-e-normativa/decreto-directoriale-n-1409-del-14-9-2022.

ICDP Support for geothermal drilling projects - a guideline for future proponents



To prioritize the increasing number of geothermal drilling proposals in recent years, ICDP has implemented a task force to define ICDP's role and strategy in promoting and supporting geothermal-focused projects. This process led to a strategy paper of which the first -shorter- version is now available to the community providing a guideline for future proponents of geothermal ICDP proposals. This document is available online and has been recently presented at the ICDP booth at the European Geothermal Congress (October 17-20 in Berlin).

ICDP guidelines download Link for the website and sources.

Employment Opportunities

Two PhD positions in geochemistry/paleoclimate at the ICBM, Oldenburg, Germany The projects are focussed on IODP expeditions 383 (Plio-Pleistocene dust provenance) and 396 (Paleocene-Eocene volcanism and climatic impact). For any questions: Torben Struve (IODP 383: t.struve@icbm.de) or Jack Longman (IODP 396: jack.longman@uni-oldenburg.de).

New positions for n. 1 atmospheric scientist and n.1 research engineer will be opened soon at CNR-ISAC Bologna. In the framework of ICOS-Italy, CNR-ISAC will open soon two selections for one atmospheric scientist and one research engineer. The positions will have a 2.5 year duration under fixed-term contract. Both the positions will be devoted to investigation of greenhouse gas variability. For information and CV sharing, please contact p.cristofanelli@isac.cnr.it

Tenure-track Assistant Professor or Associate Professor in Soil Biogeochemistry, Faculty of Science, University of Copenhagen. The Department of Geosciences and Natural Resource Management (IGN) at University of Copenhagen is looking for a highly talented research leader in terrestrial biogeochemistry. The position is opened in association with the Center for Landscape Research in Sustainable Agricultural Futures (land-craft.dk). Food security, climate change and loss of biodiversity represent three of today's major societal challenges. Finding solutions for all these challenges requires studies that extend across multiple spatial-temporal scales. The Land-Craft center brings together experts on climate impact research and landscape analyses with backgrounds in biogeochemistry, agronomy, biology and geography of Aarhus and Copenhagen Universities as

well as of external partners. Land-CRAFT was formed in June 2022 to undertake fundamental and applied research from field to landscape scales that will address the outlined societal challenges. For further information click here.

PhD and MS positions in Ecosystem Ecology are available in the Center for Ecosystem Science and Society (Ecoss) at Northern Arizona University. The impact of climate change on Alaskan ecosystems, including effects of changing fire and permafrost on plants, soils, and ecosystem services. For info Michelle Mack (michelle.mack@nau.edu) Terrestrial ecosystems and global change: above and below ground processes, plant carbon allocation, biosphere-atmosphere interactions and feedbacks, radiocarbon, and phenology. For info: Mariah Carbone (mariah.carbone@nau.edu).

Two tenure track faculty positions in Chemical Oceanography open at University of South Florida. For info click here. (Job Opening Number: 32277 Tenure-Track Chemical Oceanographer).

Research Engineer (permanent position - Stockholm University). For info click here

Postdoctoral Research Scientist position, Lamont-Doherty Earth Observatory of Columbia University. For further information click <a href="https://example.com/here/bearth-Doherty-Earth-Observatory-click-here/bearth-Doherty-Earth-Observatory-click-here/bearth-Doherty-Earth-Observatory-click-here/bearth-Doherty-Earth-Observatory-click-here/bearth-Doherty-Earth-Observatory-click-here/bearth-Doherty-Earth-Observatory-click-here/bearth-Doherty-Earth-Observatory-click-here/bearth-Doherty-Earth-Observatory-click-here/bearth-Doherty-Earth-Observatory-click-here/bearth-Doherty-Earth-Observatory-click-here/bearth-Doherty-Earth-Observatory-click-here/bearth-Doherty-Earth-Observatory-click-here/bearth-Doherty-here-bearth-Doherty-

Assistant Professor of Earth System Science (tenure track): Organic Geochemistry. Earth System Science - UC Irvine. Application deadline Saturday, Dec 31, 2022 For further information click here.

Assistant Professor, Geosciences in Critical Zone Science - New York, USA. UNION College Application deadline 01 December 2022 - 22:00. For further information click here.

University of Florida College of Marine Science is hiring 2 faculty positions in Chemical Oceanography. Review of applications will begin December 2, 2022. For info download the pdf here.

The Ocean Sciences Department at UC Santa Cruz is recruiting two biological oceanographers as Assistant to Associate Professor of Ocean Sciences. July 1, 2023, with the academic year beginning in September 2023. Degree requirements must be met by July 1, 2023, for employment effective July 1, 2023. For further information click here.

Postdoc position in Helsinki - isotope signal in tree-rings and carbohydrates. The project examines intra-seasonal d13C and d18O signals in sugars and starch and connects these with intra-and inter-annual tree ring isotope composition. For more information: e-mail: katja.rinne-garmston@luke.fi

Fellowship. At the Research Institute on Terrestrial Ecosystems of Porano (TR) in Umbria (www.iret.cnr.it), we are looking for a graduate fellow in Biology, Natural, Agronomy Sciences or similar to make part of a project MicroPlantAlp. The project aims at studying the relationship between alpine vegetation and microbial communities in the context of climate change. Activities are foreseen both in the field and in the lab, with a period in an abroad laboratory (France). For more info, please contact angela.augusti@cnr.it.

CALL for post-doctoral position - ICDP Drilling Project. A call for a post-doctoral position to work on carbon biogeochemistry is now open in the frame of the International Continental Scientific Drilling Program (ICDP), and funded by FAPESP. Project title: Trans-Amazon Drilling Project: origin and evolution of the forests, climate, and hydrology of the South American tropics (TADP) <u>Link for further information</u>, Application announcement <u>click here for the link</u>. The application process closes on November 10th.

Useful links

- The Earth Science Women's Network (ESWN) https://eswnonline.org
- TED Animation Talk -The carbon cycle Nathaniel Manning https://ed.ted.com/lessons/the-carbon-cycle-nathaniel-manning
- ICOS https://www.icos-cp.eu/r
- DCO https://deepcarbon.net/
- IPCC https://www.ipcc.ch
- IODP_http://www.iodp.org
- SOLAS http://www.solas-int.org
- Critical Zone Observatory NSF https://www.czen.org
- La!DOM, a research group at the CNR-IBF studying marine carbon cycle https://www.ladom.it/
- Calculate your CO2 emissions! https://www.carbonfootprint.com/calculator.aspx

Visit the webpage https://dta.cnr.it/ciclo-del-carbonio. You'll find all previous issues of the CarboNetwork newsletter.

For comments and suggestions, or simply to get in touch write to carbonetwork@cnr.it

Contribute to the NEWSLETTER CarboNetwork

The NEWSLETTER CarboNetwork is released every four months, on February 15th, June 15th, and October 15th. Please send your contribution to the next newsletter anytime before the release by uploading your contribution on the online form at the address https://forms.gle/fvEwWUYKrUQjhUicA. Contributions arriving after the 1st day of the release month will automatically go to the next newsletter.

Our Goodbye

"Creativity is above all the ability to continually ask questions." Piero Angela





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