



Physical Research Laboratory, Ahmedabad

Colloquium 21_08

- Speaker:** Prof. Devesh K Sinha
Department of Geology, Centre of Advanced Study, Delhi University
- Title:** 'Paleobiogeographic and biostratigraphic evidences for role of Ocean gateways in changing ocean circulation and global climate during Cenozoic'
- Date and Time:** Wednesday, 24 March 2021, 16:00 – 17:00 hrs
- YouTube Link:** <https://www.youtube.com/watch?v=-whCU3HQWwg>
- WebEx Link:** <https://prldir.webex.com/prldir/j.php?MTID=m726f15529642e500df8ad933dfa25828>
Meeting number: 158 886 5234 Password: V7f37azRD4N

Abstract

Ocean circulation plays a vital role in modulating the world's climate. Surface currents moving from low to high latitudes deliver immense heat to the colder region and moderate the climate. One of the best examples is Gulf Stream which is considered to save North America and Europe from the extremely cold climate. The thermohaline circulation translates itself into the great ocean conveyor belt, which connects the world oceans through the surface and deep currents. The cold oceans are also a huge sink for the atmospheric carbon dioxide, while the warm oceans are the sources. The surface ocean circulation is largely controlled by the ocean-continent geometry, which has been changing through geological time. The changes have resulted in the opening and closing of major ocean gateways causing major climatic events, including the formation of the permanent ice cap on Antarctica, Northern Hemisphere Glaciation, and East African aridification. During Cenozoic, the plate movements caused the opening of the Drake Passage and Tasman gateway, which resulted in the establishment of the Antarctic Circumpolar Current, a major cause for the development of ice sheets in Antarctica. The deepening of the Greenland-Scotland Ridge in the North Atlantic allowed the establishment of the North Component Deep Water and Atlantic Meridional Ocean Circulation (AMOC). The closing of the Indonesian Seaway resulted in East African aridification in the Early Pliocene, while during Late Pliocene, the closing of the Central American Seaway is attributed to enhance the northern hemisphere glaciation. Foraminiferal biogeographic and biostratigraphic studies have been very instrumental in understanding the opening and closing of the ocean gateways during the Cenozoic and their impact on palaeoceanography and paleoclimatic changes.

The Speaker

Prof. Devesh K Sinha is presently Honorary Director at the *Delhi School of Climate Change and Sustainability (Institution of Eminence)* and a Professor of Oceanography and Marine Geology in the Department of Geology, Centre of Advanced Study at Delhi University. He obtained his Ph.D. degree from Banaras Hindu University and later worked as Post-Doctoral Fellow at the University of Kiel, Germany. He has been Head of the *Department*, Dean- Faculty of Sciences, Dean of Colleges, Chairman- Board of Studies in Faculty of Science, and Chairman-the Non-Collegiate for Women Educational Board (NCWEB) of Delhi University. He has an intense association with teaching Oceanography and Micropaleontology, Paleoclimate and Stratigraphy and has been in academic committees and expert panels of several universities and national research bodies (DST, CSIR, UGC, ISRO). He is a recognized and reknowned expert in the Integrated Ocean Drilling Programme (IODP), participated in International Oceanographic Expeditions (viz. JGOFS), and published extensively on the paleoceanography of southwest Pacific, Southern Ocean, and North Atlantic. He also studied Alpine Glaciers for recession assessment. He has contributed to several refinements in Cenozoic Time Scale, which are incorporated in the most recently published Geological Time Scale by Elsevier in 2020. Currently, he is supervising four International Research Projects on the 'Global Cenozoic Ocean.'

ALL ARE WELCOME

