

Paper ID: PT-03**Antarctica: Exploring the Frontiers of Nature and Science****Plenary Talk**

Sandip Rashmikant Oza¹

¹Retd. Scientist, Space Applications Centre (SAC-ISRO), Ahmedabad-380015, India

Email: sandip.r.oza@gmail.com

Abstract

Antarctica is one of the most significant frontiers in nature and science, exerting disproportionate influence on global climate stability, sea level, ocean circulation, atmospheric dynamics, ecosystems, and planetary observation systems. This comprehensive review synthesises multi-disciplinary research works on cryospheric, oceanic, atmospheric, ecological, technological, and cosmological aspects conducted across Antarctica. Drawing on satellite remote sensing, in situ observations, artificial intelligence, numerical modelling, and astrophysical experiments, the article integrates peer-reviewed findings for MSc and PhD students and faculty.

Keywords: Antarctica, Global Climate System, Cryosphere Dynamics, Remote Sensing, Multidisciplinary Research