

## Dr. Runa Antony



**Dr. Runa Antony** has been instrumental in initiating new research approaches in the field of polar biogeochemistry that lead to significant findings on the distribution and source of organic matter in the Antarctic snow/ice. Her research is focused on biogeochemical processes in diverse supraglacial environments in Antarctica that shape the cycling of carbon, nutrients and biomass, and also affect the physical behaviour of glaciers. Her work has provided important insights into the biogeochemical processes and the role of microbes in modifying glaciochemistry through their metabolic activity, with potential implications for interpretations of ice core paleoclimatic records. She used emerging scientific technologies in conjunction with innovative field experiments, to elucidate the molecular details of dissolved organic matter in Antarctic ice, leading to pioneering contributions in the understanding of the nature and cycling of organic matter in the Antarctic environment. The unique impact of this study is that it provided compelling evidence regarding organic matter sources, atmospheric processing and anthropogenic inputs to polar ice and how these have varied over time.

Dr. Antony has conducted field experiments and extensive sampling under extreme Antarctic weather conditions, for insights into carbon cycling in glacial environments. Her PhD work entitled ‘Bacteria and their role in organic carbon dynamics in Antarctic snow’ is a seminal contribution to the understanding of carbon cycling in polar environments and the role of bacterial ecosystems.

Dr. Antony has also played a major role in establishing cryobiological research facilities in the country. Considering the quality of the research undertaken by Dr. Antony, she was awarded with the prestigious international SCAR (Scientific Committee on Antarctic Research) Fellowship in 2011. Further, in recognition of her outstanding contributions and initiatives in Antarctic science, she was awarded the Certificate of Merit for Outstanding Contribution in the field of Polar Sciences in 2014 by the Ministry of Earth Sciences. She was also elected as an Associate of the Indian Academy of Sciences in 2017. During the short span of her research career at NCPOR, Dr. Antony has published 13 high quality peer-reviewed research publications in reputed, high-impact international journals with a cumulative impact factor of nearly 46.7, which is a testimony to the high quality and world-class research undertaken by her. Most importantly, her publications have been extensively cited (235 citations) by international scientists and discussed in prestigious journals like Nature Geoscience, Nature Scientific Reports, etc.

Dr. Antony’s publications on supraglacial organic carbon revealed for the first time, the nature of dissolved organic matter (at the molecular level) in Antarctic snow providing novel insights on potential carbon inputs and sources in a key part of the glacial biome and their transformation by photochemical and microbial processes, thus, leading to a better understanding of the biogeochemical processes in glacial ecosystems. Her publications have also provided a new perspective on the role of snow pack processes in impacting the chemistry of the overlying atmosphere through the production and release of reactive gas phase species to the atmosphere and contribute to the understanding that air-snow exchange processes play an important role in processing atmospheric species, thereby impacting the climate. Her publications on the geochemical and microbial characteristics of cryoconite hole environments in Antarctica provide novel insights on cryoconite holes from locations in the Antarctic where there were little or no data before. Her publications

---

on the role of microbiota in biogeochemical cycling significantly contributes to the understanding of the biodiversity, physiological adaptations and functional roles of glacier microbes and comes at a crucial time where the ecological implications of rapid glacial melting and retreat under climate change are of considerable research interest.

In addition to the high-quality research undertaken, Dr. Antony has actively collaborated with national and international institutions that led to fruitful research output and capacity building in India. She has also developed leadership skills and has proven leadership qualities. To summarize, Dr. Antony has significantly and uniquely contributed to the advancement of science in the field of cryospheric processes and biogeochemistry of Antarctic snow and ice that would advance India's reputation in polar science.

In recognition to her outstanding research contributions in the field of Earth System Sciences, the Ministry of Earth Sciences honours Dr. Runa Antony with the “Young Researcher Award in the field of Earth System Science” for the year 2019.