



Under the ice: new geological insights into the subglacial bedrock of interior East Antarctica

Alessandro Maritati (1), Jacqueline Halpin (1), Joanne Whittaker (1), and Nathan Daczko (2)

(1) Institute for Marine and Antarctic Studies, University of Tasmania, Hobart, Australia (alessandro.maritati@utas.edu.au),

(2) ARC Centre of Excellence for Core to Crust Fluid Systems and GEMOC, Department of Earth and Planetary Sciences, Macquarie University, Sydney, Australia

Revealing ice-covered geology in the remote interior of East Antarctica remains one of Earth's last exploration frontiers. The East Antarctic rock record spans billions of years, forming one of the largest Precambrian continental shields which holds clues to understanding the assembly and breakup of supercontinents in deep time. This bedrock also provides the substrate to the ice cap, influencing the thermal state and mechanical stability of East Antarctica's largest and most vulnerable glacial drainage basins. However, less than 1% of the Precambrian East Antarctic Shield is exposed and the tectonic architecture of vast areas of the interior of the continent remains virtually unknown and only inferred largely from the projection of former Gondwana geological counterparts into Antarctica.

Here we present recent advances in uncovering subglacial bedrock in East Antarctica – we focus on the Wilkes region of East Antarctica, that represents part of the Australian conjugate margin, where we used multiple datasets including aero-geophysical data, potential field modelling and rock- and sediment-based geological analysis to provide new insights into the tectonic evolution and geological architecture of this sector of the East Antarctic Shield. In addition, we show how our new interpretation of age and composition of subglacial bedrock can help study solid earth-cryosphere interactions, informing estimations of the spatial distribution of crustal radiogenic heat production and geothermal heat flow, and the potential implications for Antarctic ice sheet models.