



## **Connecting geology and geophysics (CGG): Delineation and characterisation of major tectonic provinces in Dronning Maud Land, East Antarctica, and significance for Gondwana assembly**

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Integrating geophysics with geology, and specifically geochronology, reveals the complex tectonic history of Dronning Maud Land, an important part of East Antarctica, and a crucial element for Rodinia and Gondwana reconstructions. We recognise three major tectonic provinces: a westernmost part with Kalahari, Africa, affinities and an easternmost part from about 35E with Indo-Antarctic affinities; sandwiched in between these two blocks, is an extensive region with juvenile Neoproterozoic crust (ca. 990-900 Ma), the Tonian Oceanic Arc Super Terrane (TOAST) that shows very limited signs of a pre-Neoproterozoic history. We have tested the spatial extent of the TOAST by a regional moraine study that confirm the lack of older material inland, though latest Mesoproterozoic juvenile rocks frequently do occur in the glacial drift and probably record a slightly earlier precursor of the TOAST inland. The TOAST records 150 Ma of almost continuous tectono-metamorphic reworking at medium- to high-grade metamorphic conditions between ca. 650 to 500 Ma. This long-lasting overprinting history is thought to record protracted accretion of ocean island arc terranes and the final amalgamation of East Antarctica along the major East African-Antarctic Orogen. There is no sign of significant metamorphic overprint immediately after the formation of TOAST. Therefore, these island arcs may have formed independent of or peripheral to Rodinia and may reveal major accretionary tectonics outboard of Rodinia.