

Oxygen activity may define the depth of incipient melting beneath ridges and thereby influence the flux of volatiles to the surface, the chemistry of basalts, and the physical properties of the asthenosphere. In this talk I'll explore how high-precision measurements of the oxidation state of iron in mid-ocean ridge basalts correlates with tracers of mantle heterogeneity and how this may link to the deep carbon cycle and the physical properties of the asthenosphere.