

Temperature, Chemistry and Dynamics of the Mantle

Conveners:

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To provide stronger constraints on mantle convection, volcanism, and plate tectonics, an improved understanding of the major element, trace element, isotopic, and thermal structure of the mantle is required. These constraints come from a wide range of approaches that include experimental petrology, seismology, geodynamic modeling, petrological/chemical studies of mid-ocean ridges, large igneous provinces, and subduction zones, heat flow studies, thermal modeling, and the isotopic, trace element, major element, and thermobarometric study of mantle xenoliths. Material that is recycled at subduction zones includes delaminated continental crust, terrigenous and marine sediment, basaltic crust, and depleted abyssal peridotite. The distribution of the resulting mix of eclogite, sediment, depleted peridotite, and enriched peridotite in the mantle and the importance of these rock types as source materials for subsequent volcanism are issues of increasing interest. This interdisciplinary session will address all aspects of the variations of temperature and chemistry of the mantle and their implications for mantle dynamics and the currently contentious debate over the existence of mantle plumes.