What are the factors that control the long-term stability of the continental lithospheric mantle?
Interaction of the convecting asthenospheric mantle with the continental lithosphere?
Delamination, influence of adjacent subduction processes.
Origin of compositional variations, density variations, variations in physical proerties and link to seismic parameters.

Transfer of heat from asthenosphere to continental lithospheric mantle

Stability of continental lithospheric mantle / tectosphere – grain size variations – variations in diffusion / dislocation creep boundary, link to seismic anisotropy and velocities.

Secular cooling of earth – highly uncertain – need better constraints
Should continental roots cool at same rate as rest of mantle.
Implications for variations in ocenaic crust generation processes and subduction processes through time.

Continental lithospheric mantle is the only place where we can place physical mantles at various depths and link to rock properties and seismic properties.

Mechanisms for isolations regions of mantle from convecting mantle and then returning them.

Differences between experimental residues and mineral data to xenolith results.
No change in seismic velocity with melt depletion – experiments
Xenolith data using Mg as proxy for melt depletion, infer change in seismic velocity.
Why the difference?

Grain size differences between convecting mantle and lithospheric mantle
Maybe affects attentuation and anisotrophy.

More mineral physics data on upper mantle phases other than olivine.

Need better constraints on water content and distribution in mantle, plus how this affects physical properties on minerals, rheology etc.
Length-scale of water variations in mantle.