

Session T10: Insights Into the Nature of the Asthenosphere

Conveners:

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In recent years, a number of new results have helped broaden our understanding of the asthenosphere. The asthenosphere is considered to be a region of low viscosity that underlies the lithosphere and may be consistent with observations of seismic low velocity zones beneath high velocity lids. The exact nature of the asthenosphere, however, remains under debate. The objective of this session is to bring together researchers from different fields of the geosciences to provide an integrated, multi-disciplinary overview and to discuss the current state of knowledge of the origin, location, depth extent, and physical characteristics of asthenosphere. Questions of interest will include the following: What defines the asthenosphere? How does it differ as a function of tectonic environment (e.g., oceanic vs. cratonic regions)? What are the physical and chemical characteristics of the lithosphere-asthenosphere boundary? What are the roles that melt and/or water play in the properties or existence of the asthenosphere? Can the base of the asthenosphere be defined? What are the interactions between cratonic roots and the asthenosphere? And more generally, what role does the asthenosphere play in large-scale mantle dynamics? We encourage contributions from all relevant branches of the geosciences, including petrology, rock and mineral physics, geochemistry, geodynamics, tectonics, and seismology.