

Structure in Geosciences

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Most material of the Earth is situated in its deep interior and therefore subject to pressure and temperature conditions that are conventionally considered extreme. In addition, this material is largely inaccessible to direct observation; hence, knowledge of the interior structure of the Earth stems from a combination of geophysical probing methods such as the travel times of seismic waves and experimental investigations that simulate the conditions in the deep Earth. The past decades have shown that the distinctly layered structure of the mantle can be linked to phase transitions that the major constituents undergo at various depths. The talk will trace the structural changes of a few key mineral phases from crust to core, explain how their crystallography controls the evolution and current shape of the Earth, and highlight the role of neutron research for understanding global processes such as transport and storage of water in the Earth's mantle.

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