

Spin and magnetic transitions of minerals

Magnetism and magnetic properties of minerals have influenced human society and civilization in many ways, from compasses in ancient times to spintronic materials in modern days. Magnetic phenomena in minerals are directly related to the total electron spin of the incomplete d (or f) shell of the transition metal contained in minerals, and also the ordering of these spin moments. Remarkably, electron spin moments and their orderings can be altered or manipulated by pressure, temperature, chemical composition, or other factors. Thorough knowledge of spin/magnetic transitions induced by these factors not only allows the advance of spintronics (and related technologies) but also deepens our understanding toward our own planet or perhaps others. In recent years, spin transition of Fe-bearing minerals in the Earth's deep interior has attracted tremendous attention, as spin transition is accompanied by anomalous changes of the thermal, elastic, optical, and electric properties of these minerals, and thus further affecting the Earth's deep interior. In this session, we welcome experimental, theoretical, and computational works relevant to spin and magnetic transitions in minerals of geophysical, geochemical, or technological importance.