

invites to a seminar by

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Reactivity, electronic, and magnetic properties of fluorides at high compression

6th April 2017 at 1:00 p.m.

Venue: Centre of New Technologies, Banacha 2c,
Lecture Hall 0142 (ground floor)

Host: Prof. Joanna Kargul

Solids are typically 1000-times denser than gases, and for that reason it is often assumed that pressure has only a minor influence on their properties. This is not true though if solids are subject to pressures of an order of 1 GPa (= 10 kbar), or greater. Such compression can now be routinely achieved in diamond anvil cells (DACs). Probing the properties of matter at such extreme conditions, has led to many unexpected observations, such as the polymerization of nitrogen, or the cold melting of lithium.

Our studies indicated the large influence of high pressure on the properties and reactivity of inorganic fluorides. The oxidation properties of fluorine, and fluorine-rich compounds increase dramatically at large compression enabling stabilization of novel species such as AuF₂ or ArF₂. High-pressure conditions shift the balance towards ionic structure for covalent species such as XeF₂ and NF₅. Finally large compression can be used to fine tune magnetic properties, as evidence by the pressure-induced enhancement of antiferromagnetic interaction in [AgF][BF₄].