



# IFMP Seminar

**Date** Monday, November 27, 2023, at 14:50

**REC/C213**

**Speaker** Vitaliy Romaka

*IFW-Dresden*

**Title** From crystal chemistry to physical properties of some  $RT_6X_6$  intermetallics with kagome lattice

**Abstract** Electrons in a kagome lattice can form a unique band structure characterized by a flat band, which, if located near the Fermi level, can lead to a large effective electron mass and exotic transport or magnetic properties. Among the candidates for such materials are intermetallic compounds with 1:6:6 stoichiometry that crystallize in the hexagonal  $MgFe_6Ge_6$ -type structure. The talk is devoted to the experimentally observed off-stoichiometry and structural disorder effects that occur in some of these compounds, in particular, the isotypic series  $RCr_6Ge_6$  ( $R$  — rare-earth element). The peculiarities of the chemical bonding in these compounds revealed by DFT modeling are compared to the simple crystal chemistry considerations to understand the origin of the disorder and their properties better. A comparison with other isotypic series is performed to show some common structural and bonding features.

Host: J. Geck