

## Abstract:

This diploma thesis is focused on the study of the structural phase transitions in intermetallic compounds  $\text{LaPd}_2(\text{Al,Ga})_2$  by low-temperature x-ray powder diffraction and macroscopic measurements on single crystals. The results obtained from powder diffraction at room temperature confirm that the compounds crystallize in tetragonal  $\text{CaBe}_2\text{Ge}_2$  structure type (space group  $P4/nmm$ ). At low temperature all the compounds undergo the same structural phase transition by lowering the symmetry to the orthorhombic space group  $Cmma$ . Although the structural transformation is of first order, the transition is not manifested in step-like change of the phase at a certain temperature, but occurs in a broader temperature interval. In this interval the different phases coexist and transform gradually from high- to low-temperature phase. After application of hydrostatic pressure the structural transition is shifted to higher temperatures. Despite that the low temperature structures are of the same type, there is a difference between compounds containing Ga and Al in the discontinuity of the lattice parameters resulting in a distinct anomaly in electrical resistivity. In pressures  $>0.6$  GPa this characteristic anomaly on single crystalline  $\text{CePd}_2\text{Al}_2$  is changed, indicating a pressure-induced change of the low-temperature phase. The structural anomaly can be also observed in the data of bulk measurements.