Contribution ID: **18** Type: **Wystąpienie ustne // Talk**

Experimental and theoretical studies of some Heusler compounds with 4d and 5d transition metals.

Monday, 8 September 2025 14:40 (20 minutes)

Heusler compounds have many interesting properties and applications related to their particular electronic structure. They are studied for more than century, and the first Heusler material Cu₂MnAl astonished researchers by the fact, that it is magnetic despite none of its constituent elements exhibited magnetic ordering. The absolute majority of experimental studies which were published for Heusler compounds is related to X₂YZ compositions, where X and Y are 3d metals, and Z are p-block elements like Al, Si, Ga, Ge, As, Sb. Very little is known, about experimental studies of Heusler containing
4d and 5d metals. There are some reports with Zr based Heuslers, but not many of them. Here, we present the properties of Ti₂MoAl Heusler compound, a first Heusler compound which contain molybdenum as a main constituent element and not as a dopant. In addition we will present our preliminary results with other 4d and 5d metals, we will also tell why they were not easy to synthesize using common arc melting technique. In addition, we will discuss the possibility of substitution of p-block
element by rare earth metals like La and Ce.

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Session Classification: Fizyka materii skondensowanej

Track Classification: Fizyka materii skondensowanej // Condensed matter physics