Instytut Fizyki
Wydział Matematyczno-Fizyczno-Techniczny
Uniwersytet Pedagogiczny im. Komisji Edukacji Narodowej w Krakowie

Serdecznie zapraszamy na

SEMINARIUM IF-UP

referat pt.

"Tuning of electronic properties of U- and RE- metallic systems by H absorption"

Wygłosi

dr Silvie Maskova

(Uniwersytet Karola w Pradze) (IF-UP)

Seminarium odbędzie się w piątek, **8 czerwca 2018, o godz. 11:00**
w sali 514, główny budynek UP, ul. Podchorążych 2, 30-084 Kraków.

Zapraszamy!

Streszczenie:

The sensitivity of the interactions in the intermetallic systems to modification of the crystal structure makes the experimental techniques involving alteration of the atomic arrangement especially important. Various studies under compression are well-known examples of such methods. From this point of view hydrogenation can be treated as a complementary technique that provides „negative" pressure. Hydrides can be defined as compounds for which the hydrogen absorption leads to the modifications of the crystal structure, such as pure lattice expansion or the formation of a new structure. As a result, the new compounds (hydrides) exhibit qualitatively new physical properties and such modifications provide us with additional information on the peculiarities of interatomic interactions in the initial compounds.

As an example, we will compare the impact of H absorption on U- and RE-compounds using A_2T_2X (A = Rare-Earth (RE) or actinide, T = transition metal, X = *p*-metal) compounds crystallizing in the tetragonal Mo_2FeB_2 structure type (space group *P*4*/mbm*). Magnetic properties of U-compounds strongly depend on the inter-U distances. Hydrogen intrusion modifies the lattice by expanding it without changing the crystal-structure type leading to a band narrowing. As a consequence doping of U intermetallics by interstitial hydrogen leads to stronger magnetic properties. On the other hand, the hydrogen absorption has opposite effect on magnetic properties of RE_2T_2X compounds. For RE compounds, hydrogenation affects mainly the 4*f* – magnetic moments and their ordering. The exchange coupling is reduced presumably by reducing the concentration of conduction electrons.