SEMINARIUM Z MAGNETYZMU I NADPRZEWODNICTWA

Uprzejmie zawiadamiamy, że w **środę**

17 czerwca 2020 r., o godz.10:00

odbędzie się seminarium **on-line**, na którym

dr Dariusz Gawryluk

Laboratory for Multiscale Materials Experiments, Paul Scherrer Institute (PSI), Switzerland
Instytut Fizyki PAN, Warszawa

wygłosi referat na temat:

“Realizacja faz metastabilnych”

Despite a recent revolution in the theoretical design and discovery of materials with novel electronic properties, available computational tools are not able to suggest the experimental routes for realizing the desired materials. Moreover, theoretically predicted phases of chemical compounds are very often metastable in nature. Synthesis and crystal growth of metastable phases is a grand challenge in chemistry. Following conventional solid state synthesis usually leads to the most thermodynamically stable phases of a certain compound. It is commonly known that pressure (P) and temperature (T) are physical variables that can modify thermodynamic equilibrium in the system. In addition, properly tuned P and T parameters can force the reaction to adopt the most kinetically favored pathways, resulting in products that may be thermodynamically unstable. Therefore, applying high pressure to chemical synthesis creates a unique opportunity for stabilizing, e.g., complex transition metal oxides in high oxidation states, which are difficult or even impossible to synthesize by conventional solid state synthesis methods. When a low-temperature metastable phase is desired and high temperature has to be avoided, a topotactic chemical reaction is the *remedium*. As an example, such an approach provides a route from a non-layered precursor to a metastable quasi-2D transition metal chalcogenide via a series of reactions performed at room temperature.

In this talk I will present how the Solid State Chemistry group at the Paul Scherrer Institut takes advantage of our unique high-gas-pressure, high-temperature apparatuses and topochemical synthesis in order to go beyond phase diagrams to access metastable phases. I will elucidate this by means of a chemical survey with such physical phenomena as metal-to-insulator transition, antiferromagnetic ordering, superconductivity, and non-trivial topological states as a background.

Serdecznie zapraszamy
Roman Puźniak / Andrzej Szewczyk

Link do seminarium on-line i dodatkowe informacje można uzyskać, wysyłając e-mail na adres: szewc@ifpan.edu.pl