SEMINARIUM Z MAGNETYZMU I NADPRZEWODNICTWA

Uprzejmie zawiadamiamy, że w **ŚRODĘ**

4 czerwca 2014 r., o godz. 10:00

w sali 203 (bud. 1) odbędzie się seminarium, na którym

Prof. dr Leszek Małkiński

Advanced Materials Research Institute, University of New Orleans, New Orleans, LA 70148

wygłosi referat na temat:

Complex Multifunctional Materials

(referat w języku polskim)

Micro-origami techniques can be used to form complex three-dimensional structures from flat thin film patterns. Residual stresses in the films cause the film patterns to twist, roll or fold when released from the substrates by removing the sacrificial underlayer. Free-standing structures gain new functions which do not exist in the patterns attached to the substrate. For example, free-standing structures can be actuated or can sense stresses, and arrays of 3D objects show interesting responses to high-frequency electromagnetic radiation in the microwave, millimeter, infrared or visible ranges. Recent progress in the technology of multi-wall magnetic microtubes will be discussed. Change of the shape of materials modifies their physical properties. In particular, hysteresis loops and ferromagnetic resonance curves vary when magnetic microtubes are formed from rectangular film patterns. Magnetic materials can be combined with piezoelectric and other materials by deposition of multilayers. Multiferroic microtubes are free from the clamping effect and may exhibit enhanced magnetoelectric coefficients as compared to the similar structures fixed the substrate. Chemical methods can be used to synthesize core-shell multiferroic nanoparticles. A new concept of the application of the multiferroic nanoparticles to control functions of ion channels in mammalian cell membranes will be briefly introduced. Another example of multifunctional system is ferronematic, which consists of magnetic nanoparticles embedded into a liquid crystal. Liquid crystal displays (LCD) based on these composites have up to ten times faster switching times as compared to conventional LCDs. They are also expected to display magnetoelectric properties.

Serdecznie zapraszamy

Roman Puźniak
Henryk Szymczak
Andrzej Wiśniewski