

SEMINARIUM Z MAGNETYZMU I NADPRZEWODNICTWA

Uprzejmie zawiadamiamy, że w **środę**

13 września 2017 r., o godz.10:00

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

Prof. Yossi Paltiel

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wyłosi referat na temat:

„Spintronics and Superconducting Spintronics Based on Chiral Molecules”

The high level of energy dissipation associated with the present semiconductor-based integrated-circuit technology limits the devices operating frequency. In view of these problems, new concepts of computing and data storage must address the issue of energy consumption. One such concept that attracts considerable interest nowadays combines spins with electronics (spintronics). In principle, the application of spintronics should result in reducing the power consumption of electronic devices getting closer to the thermodynamic limit. Two major issues elude farther use of spintronics; material problems and the spin separation high currents.

We claim that using the spin selectivity in electron transport through chiral molecules, termed Chiral-Induced Spin Selectivity (CISS) we can realize simple local and power efficient spintronics devices. Studying the CISS effect it was found that chiral molecules, and especially helical ones, can serve as very efficient spin filters. Recently, by utilizing this effect we demonstrated a simple magnet less spin based magnetic memory. Moreover, we show that chiral molecules induce magnetization reversal in ferromagnetic thin films with perpendicular anisotropy when adsorbed on its upper surface without the use of electrical current.

To farther enhance efficiency and speed, we used superconducting thin films. Superconductivity can enhance the life-time of injected spins while reducing the circuitry Joule heating, thus spintronics devices comprising superconducting element, namely, superconducting spintronic devices, can even further reduce the power consumption. Usually superconducting spintronics require the use of complicated material systems. Our results supply a platform for simple superconducting spintronic circuits.

The CISS-based spintronics and superconducting spintronics is interesting from the scientific point of view and has the potential to overcome the limitations of other spintronics elements.

Serdecznie zapraszamy

Roman Puźniak
Henryk Szymczak
Andrzej Wiśniewski