

# **SEMINARIUM Z MAGNETYZMU I NADPRZEWODNICTWA**

Uprzejmie zawiadamiamy, że w **środę**

**20 lutego 2019 r., o godz.10:00**

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

**Dr. Susmita Saha**

wyłosi referat:

## **„Skyrmion Confinement and Damping Modulation in Magnetic Thin Films”**

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Magnetic skyrmions [1, 2] are topologically protected nanometer sized chiral spin textures with an out of plane magnetic domain at the center. Due to their various unique features such as stability given by their topology, they are considered as potential candidates for information carriers in next generation data storage devices, like racetrack memory. For such applications, it is crucial to be able to manipulate their current-induced motion in various directions. In this work, we present stable nanoscopic skyrmions confined by an array of antidots. Utilizing the induced periodic potential of the antidot lattice, we propose a method for unprecedented control of the skyrmion dynamics.

But for that purpose it is also important to understand and control the damping in ferromagnetic thin films. One of the possible ways to manipulate magnetic damping is injection of spin current generated due to spin Hall effect [3] which is an emerging phenomenon where the properties of electrical charge current can be transferred to the electron's intrinsic angular momentum (spin current), and vice versa. To measure the modulation of damping, we use a time-resolved magneto-optical Kerr effect microscope (TR-MOKE), which has the best spatial and temporal resolution to measure the damping of the ferromagnetic film. The observations will have a strong impact on the development of spintronics devices, such as spin transfer torque nano-oscillators or domain wall racetrack memories.

[1] D. A. Gilbert et. al., Nat. Commun. **6**, 8462 (2015).

[2] O. Boulle et. al., Nat. Nanotech. **11**, 449 (2016).

[3] L. Liu et. Al., Science, **336**, 555 (2012)

Serdecznie zapraszamy

Roman Puźniak / Henryk Szymczak / Andrzej Szewczyk