

The Warsaw Doctoral School in Natural and Biomedical Sciences and the Institute of Physics PAS cordially invites you to a **SPOTLIGHT TALK**

***Anisotropic magnetoresistance in metals and semiconductors***

*given by*

**dr. Karel Výborný**

FZU - Institute of Physics, Academy of Sciences Czech Rep.,

Praha, Czech Republic

on Friday, 19<sup>th</sup> April 2024, 14:00 at the IP PAS Auditorium

Duration: 45 min + question time

**The event will be available on ZOOM also, [at this link](#)**

***All Warsaw-4-Phd students (and others) very welcome!***

Abstract of the talk:

Anisotropy of electrical resistance in a conductive crystal (metal or semiconductor) can arise from various reasons, one of them being magnetic ordering. The most common means of manipulating magnetic order is externally applied magnetic field leading to the effect being called anisotropic magnetoresistance (AMR). History of AMR began in mid-19<sup>th</sup> century with its observation in transition metals (TMs) and continues until nowadays. Dilute magnetic semiconductors are among systems where, compared to TMs, the microscopic mechanism of AMR could be analysed into greater detail: semiquantitatively accurate models can be simplified substantially to a level which allows for a transparent interpretation of the origins of AMR. In this context, extrinsic and intrinsic mechanisms will be discussed and recently topical materials where the TM only introduces magnetism while the electronic structure retains its semiconducting character. The scope of AMR has thus been extended beyond traditionally considered TM ferromagnets (which found their application in hard-drive read-heads) to systems with more complex magnetic order.

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Karel Výborný received his MSc. degree at Universitas Carolina (Karlova univerzita, Praha, Czech Rep.) in 2001 and pursued his interest in magnetotransport at Universität Hamburg by investigating quantum Hall (QH) ferromagnetism in the context of fractional QH effect under guidance of Prof. Daniela Pfannkuche. After completing his doctoral studies in her group (in 2005), he returned to the Academy of Sciences of the Czech Rep. and has remained there, apart from several shorter and longer stints at North American institutions, until now as a staff researcher. His research focus shifted in the course of time from 'very clean QH' systems to somewhat dirtier solid state systems (mainly in the sense of disorder) and has included dilute magnetic semiconductors, antiferromagnetic metals and in some cases, also non-magnetic materials. Not only because of semiconducting MnTe, his favourite material, part of the motivation of his research lies in the prospect of development of novel spintronic devices.