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

Transport in bulk and single-layer systems

given by

dr. Karel Výborný

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

Praha, Czech Republic

on Thursday, 18th 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:

Electrical conductivity is the prime example of (typically linear-response) transport coefficient which can be either measured or calculated within one of quantum mechanical frameworks used to treat solid state systems. This lecture will begin by mentioning other types of transport (apart from charge) and then various types of magnetoresistances will be discussed as a motivation for the lesson core: theoretical approaches to charge transport in conducting crystals and simple electronic devices (i.e. multilayers exhibiting for example giant magnetoresistance will be excluded). To put these in some useful context, we will discuss examples of metals and semiconductors. At the end, anomalous Hall effect in MnTe (a specific antiferromagnetic semiconductor) will be briefly described to demonstrate the benefit of theory in interpreting experimental findings.

This event is supported by the Polish National Agency for Academic Exchange, grant no. BPI/STE/2021/1/00034/U/00001

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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 MnTe in particular. Not only because of the last mentioned material, part of the motivation of his research lies in the prospect of development of novel spintronic devices.