



Physikalisches Kolloquium
Einladung

Physics Colloquium
Invitation

Monday, 02 November 2020

Format: Online via Webex, at 16:15

~~Coffee and cookies will be served in front of the lecture hall from 16:00~~
Please feel free to grab a coffee and join our "virtual" get-together from 16:00

Towards optically-driven topological electronics in two-dimensional materials

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Application of mid-infrared laser fields to dielectrics and semiconductors opens an opportunity for controlling electrons in solids on 1-femtosecond time scale, i.e. at peta-Hertz rates. With the dream of PHz electronics at the background, I will discuss two related topics.

First, I will show how one can use highly nonlinear optical response of two-dimensional materials to mid-IR light to detect topological phase transitions and map out the phase diagram of the canonical Haldane model of a topological 2D material.

Second, I will show how one can use tailored light fields to induce topological phase transition in conventional, real-life 2D materials such as hexagonal Boron Nitride, and use this ability for strong-field valleytronics, both injecting electrons in a desired valley and reading out signatures of valley-selective excitations at PHz rates.