MAX PLANCK INSTITUTE
FOR THE STRUCTURE AND DYNAMICS OF MATTER

Date & Time: **WEDNESDAY, MAY 20, at 13:00**

Location: **MPSD, 900 EG 136**

Speaker: **PETER HOMMELHOFF**

Ludwig-Maximilians-Universität München

qcmd - Seminar

mpsd

Lightwave Control of Electrons in Graphene and in the Floquet Topological Insulating State

When intense few-cycle light fields are focused on graphene, interband electron motion can be driven. This interband motion can lead to Landau-Zener transitions, implying that interband transitions and interband motion are now intricately coupled -- a hallmark of strongfield physics. Because typical time scales are in the range of 1fs, the electron motion is fully coherent, leading to Landau-Zener-Stückelberg-Majorana interferometry. We will show that we can use this measure band structure properties interferometrically, and how this can be used to build logic gate with potentially petahertz bandwidth. The second part of the talk will focus on light-dressed graphene. When circularly polarized light is focused on graphene, a Floquet topological insulator state can be generated. We will show that we can probe this state with the second harmonic of the driving field. We measure anomalous Hall currents and circular dichroism.