



e-conversion



# Special Seminar

**Wednesday, September 14, 2022  
3 pm**

**ZNN, Seminar room EG 0.001**

## **“Optoelectronics of quantum materials”**

In this talk, I will present several phenomena related to light-matter interactions in quantum materials. Firstly, I will review coherent phonon spectroscopy in carbon nanotubes (CNTs) [1]. Ultra-fast laser pulse mediates electron-phonon interaction causing the vibration of transmittance with frequency matches to CNT's phonon modes. Secondly, I will show that using a pulsed laser, anomalous Hall materials can exhibit cyclotron motion without magnetic fields [2]. Finally, I will demonstrate that the trigonal warping effect can give a measurable non-linear Hall response even when the Berry curvature dipole is zero. The dc components of this non-linear Hall response is important for solar cell application and can be harvested from two-dimensional gapped Dirac systems, such as transition metal dichalcogenides [3].

[1] Nugraha, Hasdeo, et al., Phys. Rev. B 91, 045406 (2015)

[2] Hasdeo et al., New J. Phys. 21 083026 (2019)

[3] Adhidewata, Hasdeo et al., arXiv:2207.08432

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