



# Photophysics of Layered Two-Dimensional Semiconductors

Two-dimensional semiconductors combine easy fabrication and mechanical flexibility with particularly strong light-matter interaction. I will discuss the relaxation dynamics of photoexcited electrons in MoS<sub>2</sub> and WS<sub>2</sub>, with particular emphasis on the formation of excitons and free carriers, as well as the strong optical signatures of many-body effects. Moreover, we observed a particularly strong electroabsorption in MoS<sub>2</sub>. Contrary to known variants of the Stark effect, the absorption broadening increases linearly with the applied field. The achievable modulation depths bear the scope for extremely compact energy-efficient electroabsorption modulators for integrated photonics.

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