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[511] Exciton dynamics in two-dimensional quantum materials in space and time

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In 2D semiconducting quantum materials, organic semiconductors and their heterostructures, the energy of absorbed light is stored in Coulomb-bound electron-hole pairs, i.e. excitons. In our research, we have built a new photoemission-based experiment that is capable studying excitons at the space-time limit (nanometers and femtoseconds). In my talk, I will present the ultrafast formation dynamics of dark interlayer excitons in twisted WSe₂/MoS₂ heterostructures in space and time. Furthermore, I will present photoemission exciton tomography that allows us to study multiorbital contributions in the exciton formation in an organic semiconductor.

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