

O 60: Overview Talk Thorsten Deilmann

Time: Thursday 9:30–10:15

Location: S054

Invited Talk

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Exciting states in atomically thin layers — •THORSTEN DEILMANN — Institute of Solid State Theory, University of Münster, Germany

Monolayers of two-dimensional materials and its stacking unite the fascinating characteristics of the confined in-plane physics with novel features due to the interlayer interaction. Especially in semiconducting materials largely tunable band gaps and optical responses have been observed in various materials. Unraveling the corresponding excited states is a crucial challenge for basic research as well as for possible

applications in opto-electronic devices. Several external stimuli, e.g. doping, electric, or magnetic fields, can be applied to probe the response of many-particle states like excitons or trions, and thus also of its fundamental properties. Applying first-principles methods allows to predict, e.g., the quantum mechanical nature when an exciton is doped and becomes a trion, or its g factor due to the Zeeman effect. These calculations facilitate a connection of the experimental observations with the physical properties of the excited states. In the talk, several features in mono- and multilayer transition metal dichalcogenides and similar materials will be demonstrated.