WWU MÜNSTER

FACHBEREICH PHYSIK

Allgemeines Physikalisches Kolloquium
Antrittsvorlesung

Donnerstag, 16.01.2020 um 16 Uhr c.t.

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Westfälische Wilhelms-Universität Münster, Physikalisches Institut

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Quasiparticles, excitations, interactions and condensation in 2D systems

Fundamental interactions govern the properties of solid state material. Increasing interaction strength between quasiparticles can cause strong correlations, collective phenomena and even the transition to new emergent quantum phases of the many body state substationally different from properties of the weakly interacting system. To study interaction driven phenomena, two-dimensional systems are advantegeous since interactions are stronger in systems with reduced dimensions. In particular atomically thin two-dimensional layered materials receive great interest because of their unique properties. As an example, monolayers of semiconducting transition metal dichalcogenides (SC-TMDCs), such as MoS_2, excel due to their strong light-matter interaction that is dominated by exciton phenomena. Spin-, multi-valley and moiré physics renders possible manifold applications based on SC-TMDCs. Key to the integration of 2D materials into circuitries is the possibility to tune and engineer their properties on demand and on-chip e.g. by defects, dielectric environment, doping or stacking. We introduce many-body phenomena and collective behavior in 2D systems and vdW heterostack and report on distinct signatures for exciton condensation in van der Waals solids, highlighting the tunability of those systems for opto-electronics and quantum-technologies.

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Kolloquiums-Kaffee
ab 16 Uhr vor dem Hörsaal

Wilhelm-Klemm-Straße 10
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