

Eugene Wigner Colloquium

joint event of GRK 1558 and SFB 910



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“Bright p-excitons indicating exciton condensation in novel 2D materials”

Monolayers of transition metal dichalcogenides (TMDs) have recently attracted considerable interest, partially because of their unusual excitonic properties. A number of recent linear and nonlinear optical experiments on a variety of TMDs observed excitons with unusually large binding energies and strong deviations from the Rydberg series known from conventional semiconductors.

In this talk a theoretical explanation for the experimental observations is proposed, that assigns the optical transitions to p-type excitations of a BCS-like condensate of relativistic excitons. Comparison of the theoretical predictions with recent experiments shows a remarkable agreement for the resonance positions, demonstrating that the assumption of bright p-states allows for a simple interpretation of a wide range of different experimental results.

Thursday, 03.12.15 · 16:15h · EW 202

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