



Einladung

Es spricht: **Dr. Alexey Chernikov**
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Zeit: **Dienstag, 12. Juli 2016, 14:15 Uhr**

Ort: **Technische Universität Berlin
Institut für Theoretische Physik
Hardenbergstraße 36, 10623 Berlin
Raum ER 136**

Thema: **„Exciton physics in 2D semiconductors“**

Abstract:

Since the discovery of graphene, a single sheet of carbon atoms, research focused on two-dimensional (2D) materials evolved rapidly due to the availability of atomically thin, thermally stable crystals with intriguing physical properties. The 2D materials naturally inherit major traits associated with systems of reduced dimensionality: strongly enhanced Coulomb interactions, efficient light-matter coupling, and sensitivity to the environment. In particular, the considerable strength of the Coulomb forces between the charge carriers introduces a rich variety of many-body phenomena. In the class of 2D semiconductors this leads to the emergence of atom-like electron-hole quasi-particles, such as excitons, trions, and biexcitons, with unusually high binding energies and efficient light absorption.

In this talk, I will focus on the optical properties of 2D semiconductors, largely determined by strong excitonic resonances, as exemplified in recent works on atomically thin transition metal dichalcogenides. The observation of exciton binding energies on the order of many 100's of meV and the marked deviation of the electron-hole attraction from the conventional Coulomb law will be discussed. The results reflect both strong carrier confinement and the distinctive nature of dielectric screening in atomically thin materials. I will further describe how non-equilibrium conditions such as strong photo-excitation and electrical doping can profoundly alter the many-body interactions in these systems.

Gäste sind herzlich willkommen!
Prof. Dr. A. Knorr