



Seminarankündigung

Dienstag, 26. Juni 2018

13:00 Uhr

WSI, Seminarraum S 101

“New 5-point Van der Pauw method for characterizing anisotropic conductors: Studies of exfoliated black phosphorus”

A 5-point measurement method is introduced, whereby the full anisotropic conductivity tensor of an arbitrarily shaped sample can be determined.* This technique is used to characterize exfoliated black phosphorus, determining the temperature and gate-voltage dependence of the in-plane anisotropy. In addition, we examine the disorder-related transient conductivity, and observe that the commonly observed hysteresis in both electrical and photoluminescence studies of 2D materials can be characterized as a heavy-tail transient response to a step-function excitation. Dispersive diffusion equations successfully fit the transients in both the pristine and highly disordered sample limits, and a microscopic model for the response is provided, based on the continuous-time random walk model. Finally, we observe for the first time a generalized scaling behavior for the gated conductivity of 2D materials with disorder strength.

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**Prof. Dr. Matthew Grayson
Electrical Engineering & Computer Science
Northwestern University
Evanston, Illinois, USA1**