



Seminarankündigung

Dienstag, 6. Juni 2017

16:15 Uhr

WSI, Seminarraum S 101

“Synthesis and functionalisation of transition metal dichalcogenides ”

Two-dimensional transition metal dichalcogenides (TMDs) are intensively investigated owing to their unique properties, which make them of great interest for both fundamental studies and emerging applications. In the presentation several challenges to integrate TMDs with silicon technology for the realization of future electronic devices will be addressed.

In the presentation we outline the synthesis of a number of TMDs by thermally assisted conversion (TAC) of predeposited transition metal films and CVD which show great promise for the scalable synthesis of these materials. We demonstrate the high-quality using an array of characterization techniques including Raman spectroscopy, X-ray photoelectron spectroscopy and transmission electron microscopy. In particular we introduce PtSe_2 as a material which can be grown below 450°C allowing BEOL integration with silicon technology. Examples for high performance sensors, photodetectors and a photovoltaic cell with PtSe_2 will be given. Further chemical on chip functionalisation schemes for the passivation, doping and the introduction of additional functionality such as selective chemical sensing, of TMD will be presented. The gas sensor, operates at room temperature with detection limits in the ppb range for NH_3 and has very fast response and recovery times.

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