Elektrotechnisches Kolloquium

der Bergischen Universität Wuppertal

Die Fakultät für Elektrotechnik, Informationstechnik und Medientechnik lädt zur Teilnahme an folgender Vortragsveranstaltung mit anschließender Diskussion ein:

Es spricht

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Lehrstuhl für Material- und Oberflächenanalyse
Prof. Dr. Selina Olthof

über das Thema

Substrate Effects and Surface Electronic Properties in Thermally Evaporated Halide Perovskites: A Photoelectron Spectroscopy and REELS Study

Inhalt:

Metal halide perovskites have emerged as promising semiconductor materials for next-generation solar cells due to their excellent optoelectronic properties and high efficiencies. Among various fabrication techniques, thermal evaporation offers precise thickness control, good film uniformity and compatibility with large-area industrial manufacturing. However, the formation of high-quality perovskite films by thermal evaporation strongly depends on precursor transport and reactions at the underlying substrate interface.

This presentation investigates the formation and surface electronic properties of thermally evaporated formamidinium (FA)-based halide perovskites, with particular focus on precursor transport, substrate-dependent interface chemistry and mixed halide perovskite formation. Surface sensitive techniques, including X-ray and ultraviolet photoelectron spectroscopy (XPS/UPS) and reflection electron energy loss spectroscopy (REELS), are used to investigate the chemical composition and electronic structure during film growth. First, REELS is established as a surface-sensitive method for probing electronic transitions and the optical gap of halide perovskites. Later, the thermal co-evaporation of $FAPbI_3$ is then investigated to reveal how precursor degradation, background pressure and source geometry affect precursor transport and perovskite formation. Finally, the influence of different underlying substrates on halide incorporation and the growth of mixed halide perovskites is examined, followed by interface engineering strategies to control and stabilize their formation across different substrate materials. Together, the results demonstrate the crucial roles of precursor transport and substrate interface chemistry in controlling the formation, composition and electronic properties of thermally evaporated perovskites, while highlighting interface engineering as an effective approach toward more reproducible mixed halide perovskite growth.

T e r m i n: **30.09.2026, 14 Uhr**

O r t: Bergische Universität Wuppertal
Campus Freudenberg, Seminarraum FG 1.01