



OPTEXC

Invited Speaker Series

Tuning the electron-phonon coupling in semiconductor nanorod heterostructures**

The adjustment of electron-hole overlap and the distribution of photoexcited charge carriers in semiconductor nanostructures is crucial for applications ranging from lighting, which benefits from co-localized carriers and bright luminescence, to photocatalysis, which requires charge separation.

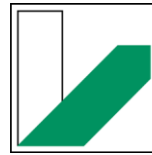
Here we present low-temperature fluorescence spectroscopy of individual dot-in-rod heterostructures and investigate elongated multi-material nanostructures with tunable charge carrier delocalization. First, we show how precise control of the energetic band alignment can be achieved by tuning the core composition. While in type-I CdSe/CdS dot-in-rods electrons and holes are mainly localized in the CdSe core, strong charge separation occurs in type-II ZnSe/CdS structures, where the electron is more strongly localized in the elongated CdS shell. We further demonstrate manipulation of the electron-hole overlap by applied electric fields. All spectra are analyzed using extended effective mass calculations, with phonon coupling modeled from electron and hole wave functions obtained by finite element calculations.

Date: Monday, 04th May 2026

Time: 1230 | Room: H11 (NWI)



Prof. Dr. Alf Mews
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OPTEXC

Tutorial Series

**History of the Nobel Price in Chemistry 2023
“for the discovery and synthesis of quantum
dots” and development of the field**

Date: Monday, 04th May 2026

Time: 1000

Room: S34 (NWI)



***Prof. Dr. Alf Mews
Universität Hamburg
Germany***