HL 75: Invited Talk: Kathrin Sebald

Time: Thursday 9:30–10:00 Location: EW 201

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Weak and strong coupling in wide-gap semiconductor based monolithic microcavities — •Kathrin Sebald — Institute of Solid State Physics, University of Bremen, Germany

Semiconductor microcavities are a versatile system to investigate and manipulate the light-matter interaction in the weak and strong coupling regime. Weak coupling has profound effects on the spatial and spectral characteristics of the spontaneous emission yielding an increase of the out-coupling efficiency. In the strong-coupling regime, the exciton and photon states lose their individual identities, and the normal modes of the coupled system become a pair of mixed exciton-photon states. The resulting polaritons have very original properties, thus, and a lot of new physics and applications is expected. Due to their large excitonic binding energy and the high oscillator strengths, wide-gap semiconductor based microcavities are particularly well suited for the investigation of photon-exciton coupling and possess a huge potential for technological applications at elevated temperatures. However, their fabrication is challenging due to the difficulty in realizing lattice-matched distributed-Bragg-reflector layers. In this talk, the optical properties of all-epitaxial wide-bandgap based microcavity structures with quantum wells or quantum dots embedded in the cavity are presented. Examples of the influence of lateral optical confinement on the optical properties will be shown for pillar structured samples with different geometries in the strong and weak coupling regime.