



Experimentelle
Physik 2

Seminar Festkörperphysik (CMP Seminar)

Aktuelle Probleme der Festkörperphysik für Studenten und Mitarbeiter
020236 Kolloquium/Seminar SS 25

Vorlesungszeit: 10.04.2025 – 24.07.2025

Thursday, 26.06.2025

12:10 – P1-01-306

GaAs Quantum Dot Platform for Multiwavelength Optical Fiber Communications

Vasilii Belykh

Innolume GmbH, 44263 Dortmund, Germany

In recent years, the capacity of optical fiber data transmission has experienced explosive growth, driven by the development of artificial intelligence and machine learning technologies. These technologies require massive clusters for parallel computation with millions of interconnects. The increase of the data rate per single fiber underlines use of wavelength division multiplexing (WDM) technologies, which require stable multiwavelength laser sources, high-speed modulators, and low-noise optical amplifiers for the modulated signals.

In this talk, I will review some recent developments at Innolume GmbH related to GaAs-based quantum dot mode-locked comb lasers and semiconductor optical amplifiers (SOAs) for fiber communications. I will outline the main challenges in this field and show the possibility of data transmission at bit rates of several Tb/s using millimeter-sized single comb laser and SOA chips.