Prof. Dirk Reuter is head of the Optoelectronic Devices and Materials group at Paderborn University since 2012

He obtained his PhD from the University Halle-Wittenberg, Germany, while working at the Max-Planck Institute for Microstructure Physics. In 1994, he joined the Ruhr-University Bochum, Germany, first as a postdoctoral researcher and then as senior scientific staff member, responsible for the molecular beam epitaxy activities in the group of Applied Solid State Physics lead by Prof. A. D. Wieck.

The research of Dirk Reuter focusses on the fabrication of heterostructures in the (In,Ga,In)As material system by molecular beam epitaxy. During his time in Bochum he worked on high-mobility two-dimensional electron and hole systems, the combination of molecular beam epitaxy and focused ion beam implantation and InAs quantum dots. In Paderborn, the main research focus of his group lies on the fabrication and characterization of high-quality quantum dot heterostructures for application in optical quantum technology. This includes a variety of growth variation within molecular beam epitaxy as strain-driven epitaxy, droplet epitaxy and local droplet etching and different material combinations resulting in different emission windows, e. g. around 920 nm and 1.55 µm. The research on quantum dots is complemented by fundamental topics in the field of molecular beam epitaxy, as remote epitaxy in lattice-mismatched systems.

Dirk Reuter is a member of the Center for Optoelectronics and Photonics Paderborn (CeOPP) as well as of the Institute for Photonic Quantum Systems (PhoQS) of Paderborn University.

1. AIP Advances 2023: Telecom C-band photon emission from (In,Ga)As quantum dots generated by filling nanoholes in In0.52Al0.48As layers

2. Phys.Rev.Lett. 2021: Giant photoelasticity of polaritons for detection of coherent phonons in a superlattice with quantum sensitivity

3. J. Cryst. Growth 2022: Remote epitaxy of InxGa1-xAs (0 0 1) on graphene covered GaAs(0 0 1) substrates

4. Nat.Commun. 2022: Nonlinear down-conversion in a single quantum dot

5. Appl. Phys. Lett. 2020: Electrically controlled rapid adiabatic passage in a single quantum

6. J. Vac. Sci. Technol. 2018: Formation of self-assembled GaAs quantum dots via droplet epitaxy on misoriented GaAs(111)B substrates

7. Phys.Rev.Lett. 2024: Direct Quantitative Electrical Measurement of Many-Body Interactions in Exciton Complexes in InAs Quantum Dots

8. Nat.Phys. 2013: Charge noise and spin noise in a semiconductor quantum device

9. Phys.Rev.Lett. 2005: Coulomb-Interaction-Induced Incomplete Shell Filling in the Hole System of InAs Quantum Dots