

Priyabrata Mudi earned his Ph.D. degree from the Homi Bhabha National Institute, India in 2021. During his doctoral research involved the exploration of optical spin injection and detection in III-V semiconductor nanostructures. His primary focus was on understanding the influence of higher valleys in these semiconductor structures, aiming to advance the field of spin Hall devices. Additionally, he contributed to research on the impact of the built-in electric field on the emission characteristics of InAs/GaAs quantum dot laser structures.

In 2021, P. Mudi joined RWTH Aachen University in Germany, where he shifted his research focus to optical interfaces for electrically defined spin qubits. His project involved the development of InAs self-assembled quantum dot-based optical interface devices tailored for gate defined quantum dots in AlGaAs/GaAs heterostructures. The ultimate goal of this device is to enable high-fidelity quantum state transfer between spins and photons, a critical requirement for quantum networks.

Since April 2023, he has been a member of AG Reitzenstein at the Technical University of Berlin. His current endeavours include pioneering the development of a fiber-coupled hybrid light source within a hexagonal pillar array for quantum communication at telecom wavelengths. Additionally, he is actively engaged in crafting an electrically tuneable Bullseye cavity for bright single-photon emission.

Recent Publications

1. Signature of linear in k Dresselhaus splitting in the spin relaxation of X-valley electrons in indirect bandgap AlGaAs”, Priyabrata Mudi, Shailesh K. Khamari, Joydipto Bhattacharya, Aparna Chakrabarti, and T. K. Sharma, Physical Review B. **104**, 115202 (2021).
2. “Impact of Built-In Electric Field on the Emission Characteristics of InAs/GaAs Quantum Dot Laser Structure” Nitika Gupta, P. Mudi, A. Yelashetty, T. K. Sharma, and D. Dhirhe physica status solidi (b), Phys. Status Solidi.B, **258**, 2100090 (2021).
3. “Full-zone optical spin injection in $Al_xGa_{1-x}As$ alloys” Priyabrata Mudi, Shailesh K Khamari, Carlo Zucchetti, Federico Bottegoni, TK Sharma, preprint (2023), doi: [10.13140/RG.2.2.22377.16486](https://doi.org/10.13140/RG.2.2.22377.16486)