

The Paul Drude Institute for Solid State Electronics (PDI) in Berlin, Germany, is a scientifically independent research institute with about 100 employees from more than 15 nations, performing basic and applied research at the interface of materials science, condensed matter physics, and device engineering. PDI is an international leader in the growth of novel optoelectronic materials by molecular beam epitaxy and their characterization, conducting research on fundamental physical aspects and applications of functional hetero- and nanostructures, superlattices, and artificial materials by design. The PDI is a member of the Leibniz Association and part of the [Forschungsverbund Berlin e. V.](#) We invite applications for a

Ph. D. Student (f/m/d) – Carrier Diffusion in Ultrawide Bandgap Semiconductors

The PDI has recently secured funding to establish an application laboratory for time-resolved cathodoluminescence spectroscopy, which combines high spatial, spectral and temporal resolution to investigate the dynamics of charge carriers in semiconductors. Within this framework, we will expand our characterization of ultra-wide bandgap semiconductors, attempting both to elucidate fundamental material properties and to identify loss mechanisms that limit potential device performance. Materials such as AlN, hBN, Ga₂O₃ and their related alloys hold great promise for applications in power electronics as well as for emitters and detectors in the deep ultraviolet (UV) spectral range, which can be used for a wide variety of applications (e.g. surface disinfection or water purification). You will use both time-integrated and time-resolved cathodoluminescence as well as photoluminescence spectroscopy to study these materials with an initial focus on the (Al,Ga)N material system. In particular, we have worked extensively on determining the carrier diffusion length and on elucidating the role of extended defects in GaN and you will extend this methodology to UV-emitting materials. Your research will benefit from our unique combination of experimental facilities and the expertise of a number of collaborating scientists.

We welcome applications from students with a Masters degree in physics, or a related field. Interest in or hands-on experience with electron microscopy, luminescence spectroscopy or widegap semiconductors is a plus. We are looking for students who want to learn, to understand, and to bring in their talents and skills into our highly motivated team of researchers and technicians and to become an integral part of our research endeavor.

This Ph.D. position is temporary and initially limited to three years, with the goal of submitting a Ph.D. thesis to either the Humboldt University or the Technical University of Berlin. Salary and benefits will be in accordance with the Treaty for German public service (TVöD Bund) at 66% of the E13 level compensation. PDI takes an active role in building a talented, inclusive, and culturally competent workforce. We aim to increase the number of female scientists and staff at the institute, and applications from women are particularly encouraged. Among equally qualified applicants, preference will be given to candidates with disabilities. As equal-opportunity and family-friendly employer, we offer highly flexible employment conditions, such as flexible working hours, parental leave, home office, and strive to create a family- and life-conscious working environment.

Please submit your application as PDF via email to jobs@pdi-berlin.de by **April 17, 2023** with the subject line "WideGap" and include a cover letter, curriculum vitae, contacts for references, degree(s), and transcript(s). For questions about the project, contact Dr. Jonas Lähnemann (he/him/his) laehnemann@pdi-berlin.de and regarding diversity, equity and inclusion contact the equal-opportunity officer Katrin Morgenroth (she/her/hers) gleichstellung@pdi-berlin.de

