Halbleiter-Nanophotonik

SFB 787

Einladung

Es spricht: **Dr. Matteo Meneghini**
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Zeit: **Freitag, 23. Januar 2015, 11:00Uhr s.t.**

Ort: **Technische Universität Berlin**
Institut für Festkörperphysik
Hardenbergstraße 36, 10623 Berlin
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Thema: **"Defect-related loss and degradation of GaN-based LEDs and lasers"**

Abstract:
Over the last decade the technology of InGaN-based LEDs and lasers has shown impressive improvements: white LEDs with efficacies in excess of 270 lm/W have already been demonstrated, while watt-class laser diodes are already available. The performance and the reliability of InGaN-based optoelectronic devices strongly depend on the quality of the material; more specifically: (i) point and extended defects may act as SRH (Shockley-Read-Hall) recombination centers, thus limiting the efficiency of the devices at low current levels, and increasing the threshold current of laser diodes; (ii) high SRH recombination components can favor the thermal droop, i.e. the decrease in internal quantum efficiency (IQE) at high temperature levels; (iii) during long-term operation, the generation of lattice defects may lead to a significant degradation of the devices (decrease in IQE, increase in the threshold current of laser diodes).

This presentation reviews the properties of the defects which limit the performance and the reliability of LEDs and lasers based on GaN. More specifically: (i) we discuss the physical origin and properties of the defects responsible for SRH recombination in InGaN-based LEDs; (ii) we describe the role of defects in favoring the degradation of InGaN-based LEDs and lasers. Original data are compared to previous literature reports to provide a clear understanding of the topic.

Gäste sind herzlich willkommen!

Prof. Dr. M. Kneissl