

## **Intraband transitions in InGaN multi-quantum well structures**

### **Internship job offer for bachelor and master students in the field of photonics, electronics, electrical and telecommunication engineering**

Lumileds R&D is searching for graduate and undergraduate students willing to contribute to the solid state lighting industry. The student/s will work in a high tech industry facility together with a professional research team of electrical engineers and physicists. The specific research project they are asked to participate in relates to fundamental studies on optical properties of InGaN multi-quantum well (MQWs) for high brightness LEDs. Optimizing spontaneous emission of light in InGaN MQWs requires deep knowledge of a number of fundamental quantum mechanical processes of low dimensional semiconductor systems, some of which comprise energy band formation in crystals, exciton dynamics, carrier recombination, quantum confinement and spin-orbit coupling. These mechanisms can be studied with the aid of widely extended tools such as those based on Fermi's golden rule, k.p theory, Schrodinger equation and the effective mass approximation. Combined with efficient computational methods and calibration techniques, the resulting models can accurately quantify relevant performance characteristics, including polarization properties, lifetimes, absorption and emission spectra.

#### *Responsibilities:*

- Support research team on the theoretical analysis of intraband transitions in InGaN QW superlattices
- Develop and test quantum mechanical models of InGaN based MQWs
- Model calibration
- Data processing Assignment

*Skills:* English, scientific programming, photonics, modeling

**Administrative requirement: Eligible or have a legal permit or able to obtain a legal permit to work in Germany** without the help of Lumileds.

Starts as soon as possible. Assignment duration: 6 months to 1 year depending on interest and availability. Interested candidate, please contact Toni López ([toni.lopez@lumileds.com](mailto:toni.lopez@lumileds.com)).