

**HL 63: Invited Talk Axel Hoffmann**

Time: Wednesday 12:00–12:30

Location: POT 006

**Invited Talk**

HL 63.1 Wed 12:00 POT 006

**Exciton-phonon coupling in nitride-based nanostructures** — G. CALLEN<sup>1</sup>, G. HÖNIG<sup>1</sup>, S. KALINOWSKI<sup>1</sup>, J. SETTKE<sup>1</sup>, C. KINDEL<sup>1</sup>, J. BRUNNMEIER<sup>1</sup>, T. MARKURT<sup>2</sup>, M. ALBRECHT<sup>2</sup>, S. KAKO<sup>3</sup>, A. SCHLIWA<sup>1</sup>, Y. ARAKAWA<sup>3</sup>, and ●A. HOFFMANN<sup>1</sup> — <sup>1</sup>Technical University of Berlin, 10623 Berlin, Germany — <sup>2</sup>Leibniz Institute for Crystal Growth (IKZ), 12489 Berlin, Germany — <sup>3</sup>University of Tokyo, Tokyo 153-8505, Japan

We review the exciton-phonon coupling in nitride-based nanostructures such as e.g. GaN/AlN quantum dots (QDs). Generally, nanostructures based on strongly polar group III-nitrides represent ideal

candidates for analyzing the exciton-phonon interaction in contrast to only weakly polar materials as e.g. the group III-arsenides. Occurring large excitonic dipole moments inherent to nitride QDs facilitate an efficient coupling to acoustical and optical phonons, clearly observable in  $\mu$ Photoluminescence spectra. We reveal a strong QD size and geometry dependence of the Huang-Rhys factor, as a measure of the exciton-LO-phonon coupling strength, and the LO-phonon energy, based on a unique conjunction of experimental and theoretical results. The given observation can be regarded as general phenomena in strongly polar nanostructured materials and highlight current limitations in regard to applications at non-cryogenic temperatures.