

The University of New Mexico Student Chapter of the Optical Society of America presents

# **MOCVD Synthesis and Characterization of III-Nitride Nanowires and Heterostructure Nanowires**

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**Friday, November 11<sup>th</sup>, at 1:00 pm**

**Center for High Technology Materials, Room 101**

**A light lunch will be served before the talk.**

Nanowires based on the direct bandgap semiconductor Group III nitride (AlGaInN) materials system are attractive due to their potential in novel optoelectronic applications, including LEDs, lasers, high power transistors, and sensors. We have employed a MOCVD process to synthesize highly aligned arrays of single-crystalline GaN nanowires in a standard cold-wall rotating disk reactor on 2 inch diameter sapphire wafer substrates without patterning or the use of a template. Building on this process, we have also been able to synthesize novel core-shell heterostructure nanowires consisting of a GaN cores and various III-nitride shell materials, including AlN, InN, and AlGaIn, and InGaIn. In this presentation, several challenges and issues regarding control of the nanowire growth process will be discussed. The effects of growth conditions on the structural, optoelectronic, and electrical properties of the nanowires will also be presented. The growth processes and reactor environment employed in this study are typical of those used to synthesize device-quality III-nitride films and should be scalable to larger commercial reactors and substrates.

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