

## **SESSION 6b: GaN Epi**

Chairs: Victoria Williams, *CREE*, and Andy Souzis, *II-VI Inc.*

The GaN epi session will present a selection of papers addressing different challenges within GaN epi technology. The first paper by Guo, et. al from IQE RF LLC will describe a study of AlGaIn/GaN HEMT uniformity using different buffer and barrier layer structures. The effects of two different types of back barrier layers, AlGaIn and InGaIn, as well as different substrate sizes, substrate polytypes, and barrier/cap structures deposited after the 2DEG, will be described as part of this study. The second paper, contributed by Faili, et. al from Group4 Labs, LLC and Air Force Research Laboratory will present results from the fabrication of GaN on diamond HEMTs by transfer and bonding of an AlGaIn/GaN epitaxial layer on a CVD diamond substrate. Diamond substrates are predicted to improve heat spreading in the gate region, increasing the potential for GaN to reach its performance limits. Progress and technological challenges of this technology will be discussed in detail. The third paper, by Gu, et. al. of Evans Analytical Group, concludes the session with a description of a method for rapid characterization of vertical threading dislocations in GaN. Scanning transmission electron microscopy (STEM) was used to reduce the complexity of this type of analysis and to identify the type and density of the dislocations.