

Physics Colloquium

Magnetic Resonance Spectroscopy of p-type Dopants in GaN and ZnO

Evan R. Glaser

Naval Research Laboratory, Washington DC

The quest to produce large hole concentrations ($>10^{18} \text{ cm}^{-3}$) with high carrier mobilities in epitaxial and bulk wide bandgap semiconductors GaN and ZnO has been of high scientific and technological interest throughout the past 20 years. The transport properties for several potential p-type dopants such as Mg and Be in GaN and Li, Na, and N impurities in ZnO have been investigated by many groups with varying degrees of success.

In this presentation I will highlight our research at NRL using defect-sensitive magnetic resonance techniques (including electron paramagnetic resonance and optically-detected magnetic resonance) that provide many insights on the nature of the electronic states associated with, in particular, Mg impurities in GaN and N in ZnO. In addition, these studies reveal the presence of dopant-related and/or other defect complex centers that act as deep trap states and limit or significantly compromise the ability to achieve high hole densities in these materials.

Thursday, April 2 at 3:40pm, Sci 234

Refreshments at 3:15 in Sci 103