

# **CONDENSED MATTER SEMINAR**

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## **Wide band gap materials, devices and applications**

Wide band gap materials (Gallium Nitride and alloys) have been very successful in addressing several key societal needs: efficient illumination (solid state lighting), efficient power conversion (power switching transistors), and high power high frequency electronics. In this talk, I will present an overview of wide band gap device technology. In particular, development of GaN-based interband tunnel junctions exploiting polarization will be discussed. Extension of this idea in developing efficient ultraviolet and deep ultraviolet emitters will be presented. Integration of wide band gap materials with van der Waals materials offer interesting opportunities to take advantage of complementary properties available in these material systems. Results on investigation of 2D/GaN heterojunctions and MBE growth of 2D materials on GaN will be presented. In the last part of the talk, I will discuss about the exciting prospects of an emerging ultra-wide band gap material system, Gallium Oxide.

**Tuesday, August 29**  
**4:00 pm**  
**Room 334 JFB**