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Professor Piner received his Ph.D. in Material Science and Engineering from North Carolina State University in 1998. Between 1998 and 2010, he worked in the semiconductor industry where he focused primarily on research and development of novel materials and processes within the III-Nitride system. Prof. Piner joined Texas State University in 2010 where he has continued to conduct research and technology development in the growth and characterization, semiconductor fabrication, and performance optimization of the III-Nitrides and diamond for device applications. Prof. Piner has 26 patents and over 100 publications, based on his research, and won numerous awards for his work.

By way of introduction to the materials to be presented; from a technical challenges perspective, less than one-tenth of the lab performance capability of GaN electronic devices has been realized commercially. Thermal impedance is a key hindrance to closing this gap. The nitrogen-face of the polar GaN crystal is a noteworthy research field. Coupled with chemical vapor deposition diamond, N-face GaN FETs will offer the next device performance revolution of wide bandgap semiconductors in a variety of harsh environments, including high temperature applications. The AlGaN/GaN structure has particularly sensitive surface states coupled to the 2DEG channel of the FET. The sensitivity is exploitable for biological, radiological, chemical, and environmental sensors. The combinable features of GaN; N-face surface, wireless functionality, and harsh environment immunity in a single, environmentally safe, semiconductor material system, could pioneer a new era in solid-state device utilization for extreme applications.

Commercialization Forum: **Communication Within a Highly Technical Organization**

Technical Seminar: **Qualifying a Technology: The Last (Most Important) Technical Step**