



DEPARTMENT OF ELECTRICAL ENGINEERING

Graduate Seminar Guest Speaker

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General Electric Global Research Center

“Wide Bandgap Semiconductor Sensors for Harsh Environments”

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11:00 AM

Knox 109

ABSTRACT

Wide bandgap semiconductors such as silicon carbide (SiC) and gallium nitride (GaN) have several unique traits which enable them to be utilized in applications where conventional semiconductors lose functionality. Due to their robust nature, SiC and GaN are able to retain their semiconducting properties in a wide variety of environments (e.g. pH of 2 to 12, up to 800 C), making them excellent candidates for use as sensors in combustion-related, high radiation and oil well drilling applications. To illustrate that potential, some examples of sensors in development will be presented, along with some of the methodology used to select the device structure and design, as well as test data. Lastly, as General Electric's Global Research Center has a growing effort in this area, and a short introduction to GE GRC along with some sensor applications will be shared.

BIOGRAPHY

Peter Sandvik earned a bachelors degree in Electrical Engineering from the University of Minnesota, and a Masters degree in the same discipline from Northwestern University in 2001. He then joined General Electric's Global Research Center, where he has since worked in the Semiconductor Technology Lab developing sensor devices using wide bandgap (WBG) semiconductors. He currently leads the WBG sensor development program, which includes UV, gas and Hall sensors for harsh environment applications. He has published over 30 peer-reviewed articles in the field of WBG devices, and holds 3 US patents with 11 others pending.