**Materials Seminar**

Department of Materials Science & Engineering

# Tuesday November 14, 2017

2:15 – 3:15 ~ SERF 307

**Please join us for refreshments at 2:10**

"Scintillators, Diagnostic Imaging & why Material Science matters "

**Speaker:**



**Dr. Matthias Schmand**   
Sr. Director Detector R&D

Siemens Medical Solutions USA, Inc.

Abstract:

Diagnostic Imaging (DI) is historically and most commonly interpreted as X-ray, CT and MR imaging providing a visual representation of the interior of a body (morphology) for clinical analysis and medical intervention. But modern advances in medical imaging allow the visual quantitative representation of biochemical and physiological parameters in vivo expanding DI by adding to morphology function, Molecular Imaging. Positron Emission Tomography (PET) and Single Photon Emission Computed Tomography (SPECT) are the two main imaging modalities of Molecular Imaging used in oncology, cardiology, neurology, inflammation, and other fields. The “motor” in PET and SPECT systems are radiation detectors which performance is dominated by their scintillation crystals, lutetium oxyorthosilicate (LSO:Ce) and sodium iodine (NaI:Tl). Both material systems are grown in high temperature single crystal growth and are doped with either Cerium or Thallium as scintillation activators. The developments of these scintillators are perfect examples of why Material Science matters. Siemens Molecular Imaging operates two fully vertical integrated detector manufacturing operations from salt to a finished detector; with manufacturing operations for LSO in located in Rockford, TN. The presentation will discuss Diagnostic Imaging technologies and their differentiation, touch on LSO and NaI crystal growth and provide examples of lessons learned related to material science in detector manufacturing.

Biography:

Dr. Schmand has more than 20 years of experiences in PET and SPECT technology, specifically in PET Detector Development. He graduated from the University of Aachen (RWTH Aachen) with a Diploma and Dr. rer. nat. in Physics. Before joining Siemens Molecular Imaging (former CTI or CPS Innovations), he did his doctoral work at Max-Planck Institute for Neurological Research in Cologne under Profs. Dr. W.-D. Heiss and Dr. K. Wienhard. As Sr. Director of Detector R&D, Molecular Imaging division of Siemens Medical Solutions USA, Inc. - a world leader in the manufacture of PET/CT, SPECT/CT and MR/PET systems, Dr. Schmand has responsibility for the research and development of all clinical PET detector systems within Siemens MI. In addition, he has held project management responsibility for the HRRT (High Resolution Research Tomograph) - the world highest resolution brain PET system for clinical use, and the BrainPET - the world first simultaneous MR/PET research prototype tomograph for human applications.