

# Physics Colloquium

## Michigan Technological University

Thursday, March 28, 2013

at 4:00 pm

Room 139 Fisher Hall



### **The Motion Management Problem and The Radiotherapy of Abdomino-Thoracic Cancers**

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**Baltimore, Maryland**

**Abstract:** Cancer remains a leading cause of death, second only to heart disease, according to the Centers for Disease Control and Prevention (CDC). Radiation therapy, the use of ionizing radiation for therapeutic purposes is one of the major means of treating cancer. In radiation therapy, a team of highly skilled professionals aim the radiation to the tumor. In the process, there is however unavoidable peripheral irradiation of surrounding healthy tissue. The primary goal of radiotherapy is to deliver conformal radiation to the tumor target at the same time minimizing the irradiation of surrounding normal tissue. Organ motion, especially respiratory induced motion poses a challenge to meeting this goal. Lung cancer radiotherapy is a good example in which more people are known to die from the disease than any other cancer. In 2008, the year with the most current statistics, CDC reports that 208,493 people in the United States were diagnosed with lung cancer of which 158,592 people died from the disease. The relatively high mortality rate for patients with lung cancer can be attributed in part to the challenges associated with the management of organ motion. In this talk, I will present an overview of the radiotherapy process; discuss innovations leading to the current standard of care to manage organ motion in the course of radiotherapy and also present current challenges and research & development opportunities relevant to the physics and engineering community

**Bio:** Dr. Teboh Roland is a practicing Clinical Physicist at the Johns Hopkins Hospital in Baltimore MD. He holds a Master's degree in Physics from Michigan Technological University and a Doctorate specializing in Medical Physics from the University of Texas Health Science Center at San Antonio. He also completed a Fellowship from the renowned Johns Hopkins University School of Medicine, where he currently works. He is certified by the American Board of Radiology (ABR) to practice Therapeutic Medical Physics and licensed by the Texas Department of Health (TDH). He holds several awards including two time recipient (2008 and 2009) of the American College of Medical Physics (ACMP) Young Investigator Award. He is a member of the American Association of Physicists in Medicine (AAPM). Dr. Teboh Roland's clinical focus includes Stereotactic Radiosurgery/Radiotherapy (SRS/SRT), where he is currently the Lead Clinical Physicist at the Johns Hopkins CyberKnife Robotic Radiosurgery center. His other interests include motion management in radiotherapy involving 4D methods – 4D treatment planning, 4D radiotherapy, 4DCT, 4D Magnetic Resonance Imaging; the application of multi-modality imaging combining CBCT, Ultrasound and MRI for real-time image guided radiotherapy (IGRT). He has authored or co-authored over ten peer reviewed journal articles and over 30 peer-reviewed abstracts.

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