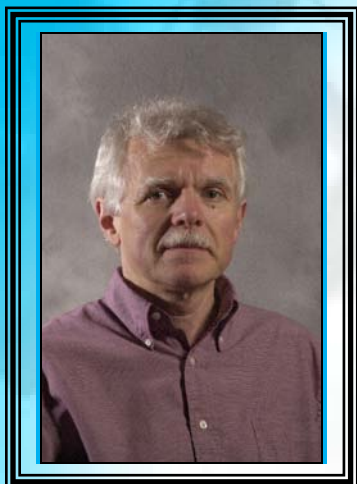


Physics Colloquium

Michigan Technological University

Thursday, November 4, 2010 at 4:00 pm

Room 139 Fisher Hall



Raman Spectroscopy as a Diagnostic Tool in Medicine

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Abstracts: Lactose intolerance is widely spread among the population. By various accounts between 60 and 70% of people in the world have deficiency of lactase (an enzyme needed to digest the lactose). Lactase deficiency varies widely among different ethnic and age groups. Nearly 20% of Black, Asian and Hispanic children younger than 5 years will develop some form of lactose intolerance. The typical symptoms are: diarrhea, pain in the abdomen, nausea and

bloating. These symptoms can be particularly dangerous for newborn children. More than 4 millions children are born every year in United States alone. Nearly 200,000 of them are lactose intolerant. Some infants develop symptoms so severe that they are at the risk of dying if not quickly diagnosed. I will describe a low cost, portable instrument, which will be suitable for full non-invasive diagnosis of the lactose intolerance condition in newborn children. The technique utilizes a unique, compact Raman spectrometer, built around a tiny laser diode similar to ones used in portable CD players. The diagnosis is based on the detection, in real time, of traces of hydrogen gas in the infant's breath at levels of few parts per million. Additionally it can be used for diagnosis of cancer, ulcer and numerous other diseases.

Bio: Dr. Borysow received his M.S. in Nuclear Physics from the University of Warsaw in Poland in 1977. In 1986 he received his Ph.D. from the University of Texas at Austin in Atomic and Molecular Physics. Before coming to Michigan Tech in the fall of 1989, he was a Member of JILA, University of Colorado and NIST in Boulder Colorado. Currently, Dr. Borysow is a faculty member at MTU in the Physics Department and faculty adjunct at the University of Texas at Austin. He is working in the field of experimental atomic and molecular laser spectroscopy.

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