

# Electrical Engineering SEMINAR

## RFID and EM Analysis for Signal Integrity

Dr. James Rautio

Founder of Sonnet Software, Inc.

Radio Frequency Identification (RFID) is a hot topic in wireless. An overview of RFID will be presented, and example designs using Sonnet described. Additionally, electromagnetic (EM) analysis for signal integrity will be looked at from a microwave point of view. First, different kinds of EM analysis and their respective advantages and disadvantages will be discussed. Some example problems and which tool you would use to solve them will be demonstrated; four EM tools are recommended. Then, the characteristic impedance problem and why it is so much more important than previously realized, especially with regard to stable, passive, and causal model extraction, will be discussed. Next, model extraction and why and how it can fail, and what you can do about it, will be presented. Finally, a common microwave measurement problem that can cause huge problems and go unrecognized for some time will be discussed. While oriented towards signal integrity, this presentation is of benefit to engineers doing microwave design as well.

**Thursday, April 23, 2009 3:30 pm** (Refreshments to be served at 3:00)

**Bell Engineering Center Room 2267**

James C. Rautio received a BSEE from Cornell in 1978, a MS Systems Engineering from University of Pennsylvania in 1982, and a Ph. D. in electrical engineering from Syracuse University in 1986. From 1978 to 1986, he worked for General Electric, first at the Valley Forge Space Division, then at the Syracuse Electronics Laboratory. At this time he developed microwave design and measurement software, and designed microwave circuits on Alumina and on GaAs. From 1986 to 1988, he was a visiting professor at Syracuse University and at Cornell. In 1988 he went full time with Sonnet Software, a company he had founded in 1983. In 1995, Sonnet was listed on the Inc. 500 list of the fastest growing privately held US companies, the first microwave software company ever to be so listed. Today, Sonnet is the leading vendor of 3-D planar high frequency electromagnetic analysis software. Dr. Rautio was elected a fellow of the IEEE in 2000 and received the IEEE MTT Microwave Application Award in 2001 and is an adjunct professor at Syracuse University.