



## FALL 2004 SEMINAR SERIES

MONTE CARLO MODELS OF  
ELECTRON TRANSPORT

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The interaction of electrons with a solid is complex because of the multiple pathways and options available to the electron. Consequently analytical models which describe even simple effects such as electron backscattering are impossible to formulate. The solution to this problem is to use the technique of Monte Carlo simulation. This presentation will briefly sketch the early history of this method and then show how the speed and performance of modern desktop computers makes the practical application of the Monte Carlo method both easy and accurate. Examples of the application of this method to the study of electron transport in solids for the purposes of imaging, lithography, and microanalysis will be given.

**BIO:** Dr. Joy is a Distinguished Professor at University of Tennessee and a Distinguished Research Scientist at the Oak Ridge National Laboratory. He received his undergraduate degree on Natural Sciences from Cambridge University, UK, and his D. Phil. Degree from Linacre College, Oxford, UK, in 1969, and was a Royal Society Warren Fellow in Materials Science at Oxford. Between 1974 and 1987, He was a Member of Technical Staff, AT&T Bell Laboratories, Murray Hill, NJ. He has published more than 380 articles, and authored/edited nine books in his field. Several of his students are active participants to Materials Science in several companies, including IBM, KLA-Tencor, Micron Semiconductors, Hitachi, among others.

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***Refreshments and pastries will be available before the seminar starts.***

**THURSDAY, DECEMBER 2, 2004**  
PHYSICS/CHEMISTRY AUDITORIUM 155  
UNIVERSITY OF KENTUCKY, LEXINGTON, KY  
**12:15 – 1:30 PM**