



Physics Colloquium

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Friday, 2 October 2009

4:00pm, PSC 3046

Transport in One Dimension: Old Puzzles, New Applications and Implications

One-dimensional systems don't exist. So why would any physicist want to study them? It turns out that some real systems, such as carbon nanotubes, are "close enough" to one-dimensional that it is reasonable to approximate them as one-dimensional when studying their transport. Some of these systems have exciting possible applications to nanoelectronics. Unfortunately (from the point of view of engineers wanting to build tiny computer components) or fortunately (from the point of view of theoretical physicists needing something to do) our understanding of transport in one dimension is extremely poor. There are a number of major unsolved puzzles. For example, what are the criteria for a classical one-dimensional system to obey Fourier's law of heat conduction? There is also confusion about some of the most elementary characteristics of transport in one-dimensional systems. For example, what are the dominant transport mechanisms in different types of one-dimensional systems? I hope to give the audience a taste of my own confusion and show off some of the things that we transport theorists are embarrassed to admit we can't predict.

For further information on Physics colloquia visit <http://physics.stfx.ca>
Doughnuts and coffee will be served at 3:45 pm