“Probing Charge Transport by Terahertz Time-Domain Spectroscopy ”

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Light pulses as short as two optical cycles (~ 5 femtoseconds) can now be produced by modelocked lasers. These pulses have dramatically advanced many areas of ultrafast spectroscopy. In this talk I will describe how we may use such pulses to control and measure electric fields on the femtosecond time scale. One important application of these capabilities is the time-domain spectroscopy in the terahertz or far-infrared spectral region. I will illustrate the application of the technique to obtain quantitative data on the conductivity of materials without the need of contacts in systems including photoexcited insulators, nanostructures, and organic semiconductors. Effects such as polaronic transport in ionic crystals, quantum confinement and many-body interactions in nanostructures and disorder on the transport properties will be discussed.

Monday April 14, 2008
4:00 pm. Room 206
Engineering and Physics Building

Texas A&M University
Institute for Quantum Studies

Coffee and cookies to be served at 3:45 p.m.