

# **Michigan Tech**

**Mathematical Sciences Colloquium  
Michigan Technological University  
Friday, March 6, 2015  
1:05 p.m.**

**Fisher Hall 101**

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***Mathematical analysis and time-domain finite  
element modeling of invisibility cloaks with  
metamaterials***

**Jichun Li**

**University of Nevada, Las Vegas**

Abstract: In the June 23, 2006's issue of *Science* magazine, Pendry et al and Leonhardt independently published their works on electromagnetic cloaking. In Nov. 10, 2006's *Science* magazine, Pendry et al demonstrated the first practical realization of such a cloak with the use of artificially structured metamaterials. Since then, there is a growing interest in using metamaterials to construct invisibility cloaks. In this talk, I'll first give a brief introduction to wave propagation in metamaterials, then I'll focus on the mathematical analysis of some cloak models. Numerical simulations using finite element methods in time domain will be presented.