

# WICHITA STATE UNIVERSITY

Department of Mathematics and Statistics

*The Lecture Series in the  
Mathematical Sciences Presents Our Guest:*

Prof. John Sylvester

University of Washington, Seattle, WA

*“Scattering and Inverse Scattering in the Frequency Domain:  
The Wronskian, the Paley-Wiener theorem,  
and the Scattering Support.”*

Abstract:

I will give an introduction to scattering and inverse scattering for the Helmholtz equation (i.e. the time harmonic wave equation), trying as much as possible to follow an approach that extends to other models as well.

The basic tool is the right hand side of Green's identity, which provides a direct analog of the familiar one dimensional Wronskian for ODE's. This provides a convenient link between so-called near field (observations made near the object of interest) and the far field (observations made far from the object of interest where simpler asymptotic formulas hold).

Lastly, I will describe the notion of Scattering support, which Steve Kusiak and I have been working on for the past year or so. This is a method for locating a scatterer or a radiating source, using a single monochromatic far field. The novelty here is that a single far field is far from enough data to determine the scatterer or even its support. Nevertheless, this data does determine a subset which must be part of any scatterer that produces that field.

Friday, February 21, 2003  
3:00 PM in 372 Jabara Hall

*Please come join us for refreshments before the lecture  
at 2:30 p.m. in room 353 Jabara Hall.*