1097-34-211 **Rudi Weikard*** (rudi@math.uab.edu), Department of Mathematics, University of Alabama at Birmingham, Birmingham, AL 35294-1170. *Spectral theory for left-definite problems.*

In this talk we consider spectral, inverse spectral and inverse scattering for the differential equation

$$-u'' + qu = \lambda wu$$

where $q \geq 0$ but where $w$ is only required to be real and locally integrable but not positive.

Applications include solving the Cauchy problem for the Camassa-Holm equation. (Received January 22, 2014)