1086-VK-2815 **Jessica Stewart***, jessica_stewart@baylor.edu, and **Lance Littlejohn**. *Spectral Analysis of the X_1-Laguerre Polynomials.* Preliminary report.

In a series of papers which began in 2009, Kamran, Milson and Gómez-Ullate posed the following Bochner-type problem: to find all sequences of polynomials $\{p_n\}_{n=1}^{\infty}$, with $\deg(p_n) = n$, which are solutions of a second order differential equation of the form

$$\ell[y](x) = a_2(x)y''(x) + a_1(x)y'(x) + a_0(x)y(x);$$

are orthogonal with respect to a positive weight function $w(x)$ on a real interval; and all have moments $\{\mu_n\}$ of $w(x)$ exist and are finite.

Up to a complex change of variables, their classification result shows that the only two such sequences are the "exceptional" polynomial sequences, X_1-Laguerre and the X_1-Jacobi. In this lecture, which is joint work with Dr. Lance Littlejohn (Baylor), we review this classification result and specifically discuss the spectral theory and related results, for the X_1-Laguerre polynomials. (Received September 25, 2012)