

Meeting: 1003, Atlanta, Georgia, SS 31A, AMS-SIAM Special Session on Integrable Systems and Special Functions, I

1003-33-1326 **Steven B Damelin*** (damelin@georgiasouthern.edu), Department of Mathematical Sciences,
Box 8093, Statesboro, GA 30460. *Orthogonal and extremal polynomials on discrete sets.*

Abstract: In a 1996 paper, E. Rakhmanov discovered that the zero distribution of discrete Chebyshev polynomials is controlled by a constrained minimal energy problem. Constrained minimizers are useful, for they arise naturally in many diverse mathematical areas. For example, in integrable systems they are found in the description of the small dispersion limit for the Korteg-de Vries equation and in the Continuum Limit of the Toda lattice. This talk is based on a recent paper of the author "Weighted polynomials on discrete sets", Monatshefte fur Mathematik (138)(2)(2003), pp 111-131. We will discuss theorems dealing with zero distribution, zero location and n th root asymptotics for a large class of discrete L_p extremal and orthogonal polynomials for a general class of discrete sets on a real interval. A crucial tool in our analysis is the concept of a constrained minimizer. (Received October 04, 2004)