

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

1003-33-821 **Shi-shyr Roan*** (maroan@gate.sinica.edu.tw), Institute of Mathematics, Academia Sinica, Taipei, Taiwan. *Structure of Certain Chebyshev-type Polynomials in Onsager's Algebra Representation*. Preliminary report.

In this report, we present a systematical account of mathematical structures of certain special polynomials arisen from the energy consideration of the superintegrable N -state chiral Potts model with a finite number of sizes. The polynomials of low-lying sectors are represented in two different forms, one of which is directly related to the energy description of superintegrable chiral Potts Z_N -spin chain via the theory of Onsager's algebra representation. The polynomials for both two forms satisfy the $(N + 1)$ -term recursion relations, and N th order differential equations; one type of polynomials reveals certain Chebyshev-like property. Here we provide a rigorous mathematical argument for cases $N = 2, 3$, and further raise some mathematical conjectures on those special polynomials for a general N . (Received September 29, 2004)