2006

MATHEMATICS COLLOQUIUM SERIES
UNIVERSITY OF CENTRAL FLORIDA

Tian-Xiao He

OF

Illinois Wesleyan University

will speak on

Inversion Formulas and Their Applications

Here we present several inversion formulas and their applications in the expansion and interpolation problems. First, the concept of a generalized Stirling number pair can be characterized by a pair of inverse relations, in which the problem of expansion of $A(t)f(g(t))$ (a composition of any given formal power series) can be constructively solved with the aid of Sheffer-type differential operators. Using the generalized Stirling number pair, we establish an inversion formula that can be applied to find an expansion of an analytic function f in terms of a sequence of Sheffer-type polynomials $\{p_n\}$. The result can be readily extended to the higher dimensional setting.

Secondly, multivariate rational exponential Lagrange interpolation formulas, Hermite interpolation formulas, and Hermite-Fejer interpolation formulas of the Newton type are established by using Carlita's inversion formulas. By setting q to 1, the obtained formulas are reduced to the corresponding multivariate polynomial interpolation formulas with combinatorial form.

Finally, we provide a wide class of Mobius inversion formulas in terms of the generalized Mobius functions and its application to the setting of the Selberg multiplicative functions.

DATE: **Tuesday, March 7, 2006**
TIME: **11:30 A.M. – 12:20 P.M.**
PLACE: **Math and Physics Building, Room 233**