1077-35-1055 **Alrazi M Abdeljabbar*** (alrazia@yahoo.com), Department of Mathematics and Statistics, University of South Florida, 4202 East Fowler Avenue, PHY 114, Tampa, FL 33620. *Wronskian and Paffian solutions to nonlinear partial differential equations.*

In the past several decades, many powerful and systematic methods have been developed in soliton theory for solving nonlinear differential equations, which include the inverse scattering method, Darboux transformation, Bäcklund transformation, Hirota method, the Wronskian determinants technique, and the Pfaffian technique.

The Wronskian and Pfaffian technique has been applied to a variety of soliton equations such as KdV,MKdV,NLS, derivative NLS,KP and sine-Gordon equations. Within Wronskian and Paffian formulations, soliton solutions and rational solutions are usually expressed as some kind of logarithmic derivatives of Wronskian and Pfaffian type determinants and the determinants involved are made of functions satisfying linear system of differential equations. This connection between nonlinear problems and linear ones utilizes linear theories in solving soliton equations.

In our presentation, we are going to speak about this method and its applications to a generalized (3+1)-dimensional KP equation, the Jimbo-Miwa equation, a (2+1)-dimensional Boussinesq system with variable coefficients. A necessary and sufficient criterion for the existence of linear subspaces of solutions to Hirota bilinear equations established by W. X. Ma and E. G. Fan will be discussed as well. (Received September 15, 2011)