**UTRGV** 

# School of Mathematical and Statistical Sciences

Colloquium Series

The Derivative NLS System and its Solution with the Help of the Marchenko Method

## **Dr. Tuncay Aktosun**

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#### <u>Abstract</u>

The Marchenko method is developed for the linear system associated with the integrable system known as the derivative NLS (nonlinear Schrödinger) system. The system of linear Marchenko integral equations is derived in order to solve the corresponding inverse scattering problem, and it is shown how the potentials are recovered from the solution to the Marchenko system of integral equations. Through the use of the inverse scattering transform, solutions are obtained for the derivative NLS system. Explicit solution formulas are developed in closed form by using as input a pair of matrix triplets, which correspond to any reflectionless scattering data. The Marchenko method is also developed in the discrete case, leading to solutions of the discrete version of the derivative NLS system.

#### Short Bio of the Speaker

Dr. Aktosun is a professor of mathematics at the University of Texas at Arlington, where he has been teaching since 2005. His research area is applied analysis and differential equations, with research interests in scattering and spectral theory, wave propagation, and integrable evolution equations. In addition to research and teaching, he is involved in mentoring undergraduate and graduate students in mathematics and supervising research.

### Date: Friday, September 9, 2022

Time: 4:00-5:00 pm CT

### EMAGC 1.212

#### Zoom: https://utrgv.zoom.us/j/88312410222

For further information or for special accommodations, please contact Dr. Alexey Glazyrin via email alexey.glazyrin@utrgv.edu and Dr. Baofeng Feng via email baofeng.feng@utrgv.edu