

**Meeting:** 1003, Atlanta, Georgia, SS 32A, AMS Special Session on Arithmetic Algebraic Geometry, I

1003-11-379      **Matthew A. Papanikolas\*** ([map@math.tamu.edu](mailto:map@math.tamu.edu)), Department of Mathematics, Texas A&M University, College Station, TX 77843. *Galois groups of Drinfeld modules and Carlitz logarithms.*

The Carlitz exponential function plays the role in characteristic  $p$  of the usual exponential function in characteristic 0. For example, division values of the Carlitz exponential provide the basis for explicit class field theory for the rational function field  $\mathbf{F}_q(T)$ . Also, it is the uniformizing exponential function for the primary example of a Drinfeld module, the Carlitz module.

In 1997, J. Yu proved the analogue for Carlitz logarithms of A. Baker's celebrated result on linear forms in logarithms. In this talk we will present new results on the algebraic independence of Carlitz logarithms. In particular, by introducing a Tannakian formalism for Drinfeld modules and relating it to the Galois theory of certain Frobenius semi-linear difference equations, we prove that Carlitz logarithms of algebraic numbers that are linearly independent over  $\mathbf{F}_q(T)$  are in fact algebraically independent. (Received September 13, 2004)