

# ALGEBRA SEMINAR

## *Mr. Lyndon meet Mr. Magnus: Formal Power Series Representations of Free Exponential Groups, III*

Dennis Spellman  
Temple University

ABSTRACT: Let  $F$  be a free group and suppose  $f \neq 1$  lies in  $F$ . Suppose the centralizer of  $f$  in  $F$  is generated by  $\varphi$ . Then the solution set of the one variable equation  $xf = fx$  over  $F$  is given by the values in  $F$  of the *parametric word*  $\varphi^t$  where  $t$  is an integral parameter.  $\varphi^t$  lives in the most unconstrained group  $F^{\mathbb{Z}[t]}$  containing  $F$  and admitting exponents from the integral polynomial ring  $\mathbb{Z}[t]$ . One way to get our hands on  $F^{\mathbb{Z}[t]}$  is to embed it into the group of units of a ring of formal power series in noncommuting indeterminates.

Monday, October 29, 2007, 1:40 – 2:30 pm,  
Wachman 617