1125-20-1411 **Rachel Davis*** (rachel.davis@wisc.edu). *Fox calculus in Galois theory.*

Given C, a smooth genus g curve with n punctures defined over $\mathbb{Q}$, and a prime ℓ, there exists an exterior Galois representation (terminology of Nakamura) from $G_{\mathbb{Q}}$ to the outer automorphism group of the pro-ℓ part of the fundamental group of $C \otimes \overline{\mathbb{Q}}$. The image is known to lie in the pro-ℓ mapping class group $\Gamma_{g,n}$. The goal of this talk is to describe how Fox calculus and the Magnus representation can be used to further analyze the image. (Received September 16, 2016)