The Galois group of a trimmed exponential

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ABSTRACT:

The direct Galois problem asks to compute the Galois group of certain families of polynomials and it has importance in various applications. In 1930, Schur computed the Galois group of the Taylor polynomial of degree n, and showed its Galois group is either the symmetric group S_n unless 4 divides n and then the Galois group is the alternating group A_n. The latter provided the first explicit example of polynomials with Galois group A_n.

In this talk I will discuss the two-sided trimmed exponential polynomial, that is $x^n/n! + \cdots + x^m/m!$, $m > n > 0$. (The case $n = 0$ is the above discussed Schur result). We will explain why almost surely the Galois group is the full symmetric group (of degree $m - n$) when the $m - n$ is small in comparison to m if $n > 0$ unlike the case $n = 0$, where 1/4 of the time the Galois group is A_n. We will also explain applications of the methods to families of polynomials related to the generalized Laguerre polynomials.

The talk is based on a joint work with Or Ben-Porath.