

GALOIS GROUPS OVER THE RATIONALS WITH RAMIFICATION CONSTRAINTS

MONDAY NOVEMBER 27, AT 4 PM, IN CUPPLES I ROOM 6

Speaker: Jack Sonn (Technion)

Abstract: The inverse Galois problem over the rationals has inspired several variants over time. In this talk, following an introduction to the classical problem and the basic notions involved, we will briefly review the variant which asks for the fewest possible ramified primes in a Galois realization of a finite group over the rationals $\mathbb{Q}$, and then spend most of the remaining talk on a recent variant that asks for Galois realizations of a finite group G over $\mathbb{Q}$ in which all the nontrivial inertia subgroups have order two. The only groups for which this can happen are those generated by elements of order two, for example finite nonabelian simple groups. If such a group G has a "regular" realization over the rational function field $\mathbb{Q}(t)$, as the splitting field of a polynomial $f(t,x)$, then there are computable conditions on the polynomial which guarantee the existence of infinitely many specializations of t into $\mathbb{Q}$ which yield realizations over $\mathbb{Q}$ with all inertia groups of order two. As examples, three finite simple groups will be given, together with corresponding polynomials. One application of this result is to unramified realizations of these groups over quadratic fields. Another application is to the problem which motivated this result (time permitting). Joint work with Joachim Koenig and Daniel Rabayev.