



Presents

INSOLVABILITY OF EQUATIONS IN FINITE TERMS

Speaker



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...mials consists in the following: real
...ersome systems of equations should
...results of the theory is a real tran-
...rem: for a large class of systems of
...variables, the number of roots is finite
...ove via the “complexity” of the sys-
...he construction of a category of real
...algebraic varieties in their properties.
...level sets of elementary functions and

Abstract

...as the degree of t
...of the topology de
...number of monom
...complexity of the
...the defining equati
...Descartes’ estim
...of polynomials in
...appearing with a non
...generalise Descart
...THEOREM (ON R
...of nondegenerate r
...positive orthant in
...is the number of m
...one of the P_i 's.

Abel, Galois, Liouville, Picard, Vessiot, Kolchin and others found a lot of results about solvability and insolvability of equations in finite terms. According to them, algebraic equations are usually not solvable by means of radicals. Ordinary linear differential equations and holonomic systems of linear differential equations in partial derivatives are not usually solvable by quadratures. Galois theory belongs to algebra. In fact results about insolvability of differential equations belongs to differential algebra and are also purely algebraic.

About 30 years ago I constructed a topological version of Galois theory for functions in one complex variable. According to it, there are topological restrictions on the way the Riemann surface of a function representable by quadratures covers the complex plane. If the function does not satisfy these restrictions, then it is not representable by quadratures. Beside its geometric clarity the topological results on nonrepresentability of functions by quadratures are stronger than the algebraic results. By now I have constructed a multi-dimensional topological version of Galois theory.

No preliminary knowledge is required.

Where and When?

Date: 4:00 PM, Thursday, January 18, 2007
Location: WLU, Faculty of Science
Room: BA 308

\mathbb{R}^k be an algebraic set
...the number of connected
...on $\varphi_2(k, q, m)$. If the
...numbers of the smooth
... $\varphi_3(k, q, m)$. (Here q