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Jack Wagner* (jw5788@stu.armstrong.edu) and **Sabrina Hessinger**. *Monomial Galois Groups of Homogeneous Linear Differential Equations of Arbitrary Order.*

Relative to many fields in mathematics, Differential Galois Theory is a new area which beautifully integrates many mathematical disciplines, including not only abstract algebra and differential equations, but also topology, linear algebra, and representation theory. In this talk, we will briefly present the essential elements of differential Galois theory, couching these elements in the familiar context of undergraduate ordinary differential equations, and pointing out similarities and differences with the more familiar Galois theory of polynomials. Our current work is situated in the case when a differential equation has monomial Galois group. In the spirit of earlier work of J. Kovacic, M. Singer and F. Ulmer, we begin by understanding the form of such groups and their representations. We then make use of a correspondence between reducibility properties of group representations and factorizations of associated linear differential equations to investigate implications on the solutions of the differential equation. (Received September 20, 2016)