Discrete monodromy groups and Hodge theory

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The monodromy of differential equations has been studied for a long time, providing motivation for many of the concepts in complex analysis, algebraic geometry, and dynamical systems. After providing the necessary background, I will present some applications of ideas from dynamics to the study of monodromy groups of families of algebraic varieties, and explain how they relate to differential equations. I will also describe some connections between interesting classes of discrete subgroups of Lie groups and Hodge theory.