Nonholonomic Mechanics: A Lie algebroid perspective

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The category of Lie algebroids has proved useful to formulate problems in applied mathematics, algebraic topology, and differential geometry. In the context of Mechanics, an ambitious program was proposed by Weinstein in order to develop formulations of the dynamical behavior of Lagrangian and Hamiltonian systems on Lie algebroids. In the last years, this program has been actively developed by many authors. In this talk, I wil present some recent results about the geometric formulation of nonholonomic mechanics in the Lie algebroid setting. In particular, we will discuss the existence and uniqueness of solutions of constrained systems on Lie algebroids, the nonholonomic bracket, the reduction theory and the momentum equation among other topics.