1077-VH-1789 **Jeffrey Remmel** and **Alex Brik*** (abrik@math.ucsd.edu), Department of Mathematics, University of California, San Diego, 9500 Gilman Drive # 0112, La Jolla, CA 92093-0112.

*Computing Stable Models of Logic Programs Using Metropolis Type Algorithms.*

The talk will describe a novel Monte Carlo type algorithm, which we call the Metropolized Forward Chaining (MFC) algorithm to find a stable model of a normal propositional logic program P if P has a stable model or to find a maximal subprogram P0 of P and a stable model M0 of P0 if P does not have a stable model. Our algorithm combines the forward chaining algorithm of Marek, Nerode, and Remmel with the Metropolis-Hastings algorithm of Metropolis et al. and Hastings. To demonstrate the feasibility of MFC we conducted computer experiments on logic programs to find (2, 6) van der Waerden's certificates. Logic programming with stable model semantics is a formalism for declarative programming that is well suited for solving search problems. In it a problem is modeled as a theory in some formal language, and solutions to the problem correspond to the stable models of the theory. Thus the talk combines the results of research from logic, computer science, probability theory and combinatorics. MFC can also be used with other Monte Carlo algorithms. A version of MFC that uses Stochastic Approximation Monte Carlo algorithm of Liang et al. is discussed. (Received September 20, 2011)