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Generic theories, independence, and NSOP₁

"Generic theories" are a fruitful source of examples in model theory: start with a tame base theory \( T \), expand it by adding extra structure, and take the model companion \( T^* \). Generic theories can often be shown to be simple by characterizing a well-behaved notion of independence in \( T^* \) (namely forking independence) in terms of independence in \( T \). Recently, there has been increased interest in the class of NSOP₁ theories, spurred by the work of Chernikov, Kaplan, and Ramsey, who showed that NSOP₁ theories can also be characterized by the existence of a well-behaved notion of independence (namely Kim independence). Many examples of generic theories which fail to be simple have been shown to be NSOP₁ by this method.

In this talk, I will present a number of new examples of this phenomenon: In joint work with Nicholas Ramsey, we study the theory of the generic \( L \)-structure in an arbitrary language \( L \). More generally, starting with a base \( L \)-theory \( T \) which is NSOP₁, model complete, and eliminates the quantifier "exists infinitely many", we consider the generic expansion of \( T \) to an arbitrary language containing \( L \) and the generic Skolemization of \( T \). In joint work with Gabriel Conant, we study the generic projective plane, considered as an incidence structure. More generally, we consider the generic bipartite graph omitting a fixed complete bipartite graph \( K_{m,n} \). We show that all of these examples are NSOP₁, and we characterize various notions of independence (Kim, forking, dividing, thorn forking, and algebraic independence) in these theories.