Specht's theorem, commutativity theorems, and decision procedures

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We consider the following question: Given a finite set of multivariate polynomial identities $P_1 = P_2 = \cdots = P_d = 0$, is it the case that a ring which satisfies these identities is necessarily commutative? As it turns out, one can use work related to Specht's theorem on affine representability to give a decision procedure which takes as input the set of identities and terminates after finitely many steps and gives an answer to this question. We then revisit old commutativity theorems of Jacobson and Herstein in light of this algorithm and obtain general results in this vein. This is joint work with Peter Danchev.