1078-06-140 **Simone Bova*** (simone.bova@vanderbilt.edu) and **Leonardo Cabrer**. *Type classification of unification problems over distributive lattices and varieties of De Morgan algebras.*

The equational unification problem for a variety of algebras is the problem of solving finite systems of equations in the context of free algebras. The solution space of an instance of the unification problem is ordered by generality in a natural way. The (unification) type of an instance is determined by the properties of the set of its solutions of maximal generality.

We classify by type all instances of the unification problem over (bounded) distributive lattices, and over varieties of De Morgan algebras (distributive lattices with an involution satisfying De Morgan laws). The key tool is a characterization of (posets dually equivalent to) finite projective algebras: the correspondence between finite projective distributive lattices and finite nonempty lattices was known; we establish an analogous result for finite projective algebras in De Morgan varieties.

The case of distributive lattices illustrates the idea. If S is an instance of the unification problem (a finite set of lattice equations), and P is the finite poset corresponding to the lattice finitely presented by S, then: If all maximal intervals in P are lattices, and k is the number of such intervals, then S has unitary ($k = 1$) or finitary ($k > 1$) type; otherwise, S has nullary type. (Received December 02, 2011)