Invited Talk: Extensions of AC

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Operators that satisfy the Associativity and Commutativity properties appear in many applications of equational unification. In most cases they also have additional properties such as the existence of identity and inverses (i.e., abelian groups). It was seen, early on, that such extensions of AC very quickly lead to undecidable E-unification problems—for instance, adding the distributivity axiom alone would enable a reduction from Hilbert's 10^{th} problem. In this talk, we survey attempts to "push the envelope" as far as possible; i.e., to obtain interesting extensions for which unification is decidable.