Equivalence à la Mundici for lattice-ordered monoids.

Mundici proved that the categories of (unital Abelian) lattice-ordered groups and of MV-algebras are equivalent. We provide a generalization: the category of (unital commutative totally distributive) *lattice-ordered monoids* is equivalent to a variety whose algebras we call *MMV-algebras* (for *Monoidal MV-algebras*). Roughly speaking, lattice-ordered monoids are lattice-ordered groups without the unary operation that maps x to –x, and, analogously, MMV-algebras are MV-algebras without the negation.

We will mention one reason of interest for these algebraic structures: in the same way in which lattice-ordered groups and MV-algebras are algebras of continuous functions over a compact Hausdorff space (up to infinitesimals), lattice-ordered monoids and MMV-algebras are algebras of continuous *monotone* functions over a compact *ordered* space (up to infinitesimals). In a sense, MMV-algebras are to MV-algebras what distributive lattices are to Boolean algebras.