

Algebras from homomorphism kernels

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For many classical algebraic structures (groups, rings) homomorphism kernels can be studied via naturally associated subalgebras (normal subgroups, ideals). For general algebras (even semigroups) there is no such relation to substructures.

We discuss a general functorial construction that turns homomorphism kernels into algebras. Although this changes the type of operations, it preserves many invariants (congruences, commutators, idempotent Mal'cev conditions, etc).

This allows us to relativize structure results, like the characterization of supernilpotence, from algebras to congruences. As another application we can also extend efficient algorithms for membership problems to new classes of algebras.

This is joint work with Ágnes Szendrei.

Submission for the invited algebra session