

# Free Left and/or Right Commutative Semigroups

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(joint work with Biljana Janeva)

We consider three varieties of semigroups defined by one or more linear identities. Namely, the varieties of: left commutative semigroups, right commutative semigroups and bi-commutative semigroups, i.e. the varieties of semigroups defined by the identities  $xyz \approx yxz$ ,  $xyz \approx xzy$  and both, respectively, are investigated. In each case, a description of free objects by means of suitable congruences over a free semigroup is obtained. A canonical description of free objects in each of these varieties is also obtained.

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