

# Varieties Generated by Completely 0-Simple Semigroups

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## Abstract

A *completely 0-simple semigroup* is just a semigroup with a zero, no ideals other than  $S$  and  $\{0\}$  and containing an idempotent element  $e$  ( $e^2 = e$ ) that is primitive ( $f^2 = f, fe = ef = f \implies f = e$ ). The class of completely 0-simple semigroups was one of the first classes of semigroups to be analysed in depth (by Rees and Sushkevich) in the 1930s and, as one of the most important building blocks for semigroups, completely 0-simple semigroups have played a fundamental role in the theory of semigroups ever since. The varieties generated by individual completely 0-simple semigroups have been the focus of considerable interest over the years, but it was only with the determination of a basis of identities for the variety  $\mathbf{RS}_n$  generated by all completely 0-simple semigroups with subgroups of exponent dividing  $n$  (by T.E.Hall, S.I.Kublanovsky, S.Margolis, M.Sapir and P.G.Trotter in 1997) that a general study of the varieties generated by completely 0-simple semigroups could be undertaken. This was initiated by S.I. Kublanovsky. In this talk I will discuss recent results regarding the the lattice of subvarieties of  $\mathbf{RS}_n$  and the characterization of those subvarieties of  $\mathbf{RS}_n$  that are generated by completely 0-simple semigroups.