

## Monoids and groups and a trick of Magnus

In the classic text *Combinatorial group theory*, W. Magnus, A. Karrass and D. Solitar give a thorough treatment of the relationships between free monoids, free groups, and free algebras of various sorts. The starting point for their investigations is a certain homomorphic embedding of the free monoid into the algebra of formal power series over that monoid, an embedding we call the *Magnus transformation*,  $\mu$ . This embedding has been generalized to the case of right-angled Artin groups in the work of G. Duchamp and others.

In our talk we will discuss analogues of this embedding in the context of other straightforward groups, namely the Baumslag-Solitar group  $BS(1, 2)$  and the three-strand braid group  $B_3$ . Although things are not as nice in these settings, we do obtain information regarding orderability in the case of  $BS(1, 2)$ .