## INSALATE DI MATEMATICA

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Free product with amalgamation: jumping around algebraic structures



## Abstract:

The free product with amalgamation was introduced in the realm of groups by Otto Schreier in 1927, and later in the theory of Lie algebras by Pyotr Shirshov in 1948. It is a powerful construction which allows us to combine multiple algebraic structures into a single, unified object, while preserving important properties of each individual structure. In this talk, we will explore free products with amalgamation in the context of groups, Lie algebras, and associative algebras, and see how they behave moving from one context to the other. We will eventually show under which conditions the functor associating to a group with the graded Lie algebra induced by the lower central filtration preserves such construction.

**Keywords:** Groups · Lie Algebra · Free Product with Amalgamation

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"Obvious" is the most dangerous word in mathematics. (Eric Temple Bell)