

# Braiding for categorical Leibniz algebras and crossed modules of Leibniz algebras

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## Abstract

The concept of strict categorical group is equivalent to the notion of crossed module of groups, introduced by Whitehead [2] in 1949 as an algebraic model for 2-type homotopy spaces. Linked to the concept of crossed modules of groups appear the braided crossed modules of groups and braided strict categorical groups, also equivalent categories. At the same time, the ideas of crossed modules of Lie algebras and categorical Lie algebras appear. Both can be braided, obtaining in characteristic different from 2, again, an equivalence.

In this talk we will go a step further by defining the concept of braiding for internal Leibniz algebras and crossed modules of Leibniz algebras in such a way that generalizes the definition given for Lie algebras crossed modules and internal Lie algebras case and obtaining in this new case an equivalence as in the previous cases. For this, we will use the idea of Loday and Pirashvili [1], which allows us to see Leibniz algebras as Lie algebras in the category of linear maps, giving them a monoidal category structure with a specific tensor product.

## References

- [1] J.-L. Loday, T. Pirashvili, The tensor category of linear maps and Leibniz algebras, *Georgian Math. J.* **5** (1998), 263–276.
- [2] J.H.C. Whitehead, Combinatorial homotopy. II, *Bull. Amer. Math. Soc.* **55** (1949), 453–496.