Semi-abelian categories, Hopf algebras and internal groupoids

Marino Gran
Université catholique de Louvain

Since their introduction twenty years ago, semi-abelian categories [1] have attracted a lot of interest, since they are useful to study some fundamental exactness properties the categories of groups, Lie algebras, compact groups and crossed modules have in common. In this talk I shall explain some simple ideas of this area of categorical algebra, with a special emphasis on the role of internal groupoids in semi-abelian categories. These structures are closely related to commutators, central extensions and non-abelian homology. The category of groupoids in a semi-abelian category contains various interesting non-abelian torsion theories. It can be seen as the exact completion of its subcategory of equivalence relations, as it follows from a general characterization of the semi-localizations of semi-abelian categories [2]. A couple of results concerning the internal groupoids in the semi-abelian category of cocommutative Hopf algebras will also be considered [3,4].

References

[1] G. Janelidze, L. Marki and W. Tholen, *Semi-abelian categories*, J. Pure Appl. Algebra 168 (2002) 367–386.

[2] M. Gran and S. Lack, *Semi-localizations of semi-abelian categories*, J. Algebra 454 (2016) 206–232.

[3] M. Gran, F. Sterck, and J. Vercruysse, *A semi-abelian extension of a theorem by Takeuchi*, J. Pure Appl. Algebra 223 (2019) 4171–4190.

[4] M. Gran and J.R. Gray, *Action representability of the category of internal groupoids*, Theory Appl. Categ. 37 (2021) 1-13.