Semi-abelian categories [10] provide a suitable axiomatic context to study the (co)homology of non-abelian algebraic structures (such as groups, compact groups, crossed modules and Lie algebras), torsion and radical theories, and commutators. In this mini-course a brief introduction to some elementary properties of these categories will be given, before focusing on recent developments concerning torsion theories [1, 4, 6, 9]. In particular the relationship between torsion theories and semi-left-exact reflections in the sense of [3] will be explained, as well as the connections with radicals, closure operators, categorical Galois structures, and factorizations systems [2]. Some recent work concerning semi-localizations of semi-abelian categories [9], and the relationship with some investigations on reflective subcategories of the category of groups [5] will also be discussed, leading to some interactions with the mini-course given by Jérôme Scherer.

Concerning the preliminaries to follow these lectures, some basic knowledge of the properties of regular categories and of abelian categories will be helpful. Most of the needed categorical background can be found in the notes [8], and in the second chapter of [7].

References


