

NITheCS COLLOQUIUM: Categories, groups, and non-abelian algebraic structures

Prof Marino Gran (Université catholique de Louvain, Belgium)

Attend in person at the Neelsie Cinema* or online

*1st Floor The Neelsie Langenhoven Student Centre, Stellenbosch University

Monday, 20 March 2023 | 16h00 – 17h00 SAST

Cheese and wine will be served after the event

ABSTRACT

In his celebrated article [1] S. Mac Lane mentioned the problem of finding an axiomatic context capturing some typical properties of the category of groups. This article also played a fundamental role in identifying the notion of abelian category [2], that turned out to be very useful to study the categories of abelian groups and modules over a ring.

The introduction of the notion of semi-abelian category [3] made it possible to understand many fundamental properties the categories of groups, Lie algebras, compact groups and other non-abelian algebraic structures have in common. The theory of semi-abelian categories provides an ideal setting to investigate some fundamental aspects of non-abelian homological algebra, and to develop a categorical approach to torsion theories and commutators.

This introductory talk will first focus on some basic definitions and examples in category theory. We shall then consider some properties and examples of abelian and of semi-abelian categories, by underlying some common features and a few fundamental differences. We shall conclude the talk by presenting a couple of recent results in the semi-abelian category of cocommutative Hopf algebras [4].

REFERENCES:

- [1] S. Mac Lane, Duality of groups, Bull. Am. Math. Soc. 56 (6), 486-516 (1950)
- [2] D. Buchsbaum, Exact categories and Duality, Trans. Amer. Math. Soc. 80 1-34 (1955)
- [3] G. Janelidze, L. Márki and W. Tholen, Semi-abelian categories, J. Pure Appl. Algebra 168, 367-386 (2002)
- [4] M. Gran, F. Sterck and J. Verduyn Lunel, A semi-abelian extension of a theorem by Takeuchi, J. Pure Appl. Algebra 223, 4171-4190 (2019)

BIOGRAPHY

Marino Gran is a mathematician, full professor at the Université catholique de Louvain (UCLouvain), Belgium.

After completing his PhD at UCLouvain, he held a postdoctoral position at the Fonds National de la Recherche Scientifique. That also allowed him to do research at the University of Coimbra for an extended period. He worked for a few years as maître de conférences at the Université du Littoral Côte d'Opale in Calais, where he obtained the Habilitation à Diriger des Recherches. In 2008, he moved to UCLouvain, where he has been coordinating the activities of a research group in category theory. He presently serves as president of the Institut de Recherche en Mathématique et Physique.

His main research interests concern algebra and category theory.



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