SIMBa

BGSMath
BARCELONA GRADUATE SCHOOL OF MATHEMATICS

Seminari Informal de Matemàtiques de Barcelona

***Speaker*:** Daniel Gil Muñoz.
University: University of Barcelona.

Date: Wednesday, October 4th, 2023.
Schedule: 13:00, *coffee break*; 13:20, talk.
Place: UPC (FME aula 005) and Zoom.
Language: English.

Title: The use of skew braces in Hopf-Galois theory

Abstract: The notion of Galois extension can be rewritten in such a way that it depends only on the Galois group and its action on the top field of the extension. Moreover, the group algebra corresponding to the Galois group can be endowed with a Hopf algebra structure. These facts inspire the notion of Hopf-Galois extension: an extension that admits a Hopf algebra together with a linear action on the top field satisfying analogous conditions. Such a pair is called a Hopf-Galois structure. Consequently, every Galois extension is Hopf-Galois, but not the other way around. This is the beginning of Hopf-Galois theory, a generalization of Galois theory that was introduced in the sixties of the last century and have provided a useful setting to generalize notions and results from Galois theory. More recently, it was found that each Hopf-Galois structure on a Galois extension corresponds to a skew brace: a set endowed with two group structures satisfying a variant of the distributive property. The theory of skew braces was introduced in 2007 and owes its interest to its applications on the study of the Yang-Baxter equation. This is how a connection between Hopf-Galois theory and skew braces was established, leading to a big body of research in the last years. In this talk, we provide an introduction to both of these topics as well as their link, on which we shall view some recent results.

About us: *SIMBa* is a mathematics seminar organized by graduate students in the Barcelona area. It is aimed towards graduate and last course undergraduate students. Our goals are divulging the knowledge from different branches of mathematics for those interested and promote networking between the attendants.

This seminar is backed by the Faculty of Mathematics and Computer Science at Universitat de Barcelona, Faculty of Mathematics and Statistics at Universitat Politècnica de Catalunya, the Department of Mathematics from Univesitat Autònoma de Barcelona, CRM, IMUB and BGSMath.

Fore more information, visit at `www.ub.edu/simba/en/`.

If you have any doubt or comment do not hesitate to contact us by sending an email to ***seminari.simba@gmail.com***.