

SEMINARIO DI GEOMETRIA E ALGEBRA

UNIBA - POLIBA

Lunedì 29 Giugno 2026 - Ore 15:00

Dipartimento di Matematica UniBa, Aula VI (piano terra)

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Images of polynomials on algebras: commutators and involutions

Abstract. A classical result of Shoda, Albert, and Muckenhoupt states that a matrix is a commutator if and only if it has trace zero. In this talk, I will present two recent extensions of this circle of ideas, motivated by the L'vov-Kaplansky conjecture on images of multilinear polynomials on matrix algebras.

In the first part (joint work with P. Fagundes), I introduce the notion of multitrace for elements in finite-dimensional associative algebras and show that for some classes of associative algebras, this can be used to characterize its set of commutators.

In the second part (joint work with L. Centrone), I consider polynomials on algebras equipped with an involution, where variables are split into symmetric and skew-symmetric types. In this setting, we present a complete classification of such images for two-by-two matrices with both the transpose and the symplectic involution, and discuss a counterexample showing that the natural analogue of the L'vov-Kaplansky conjecture fails in higher dimensions.



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