

Rota’s Classification Problem, Rewriting Systems and Gröbner-Shirshov Bases

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Throughout the history, mathematical objects are often understood through studying operators defined on them. Well-known examples include Galois theory where a field is studied by its automorphisms (the Galois group), and analysis and geometry where functions and manifolds are studied through their derivations, integrals and related vector fields.

A long time ago, Rota raised the question of identifying all the identities that could be satisfied by a linear operator defined on algebras. We will discuss some recent progress on understanding and solving Rota’s Problem by the methods of rewriting systems and Gröbner-Shirshov bases.

This is joint work with Xing Gao, William Sit, Ronghua Zhang and Shanghua Zheng.

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