

JORDAN STRUCTURES IN LIE ALGEBRAS

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The purpose of the talk is to show how Jordan algebras and Jordan pairs can be used to get information on Lie algebras. To any ad-nilpotent element of index of nilpotence at most three of a Lie algebra, we attached a Jordan algebra. This Jordan algebra inherits nice properties of the Lie algebra and also it reflects the nature of the element. As an application, we revisit a celebrated Zelmanovs theorem on Jordan on PI-Lie algebras with algebraic an adjoint representation. Another useful Jordan tool to study Lie algebras is that of subquotient: to any abelian inner ideal of a Lie algebra we associate a Jordan pair called its subquotient. As an application, we prove that every abelian inner ideal of finite length of a nondegenerate Lie algebra yields a finite \mathbb{Z} -grading having the abelian inner ideal as one of its extremes. Subquotients are also used to classify inner ideals of Lie algebras.