Queen's Algebraic Geometry
— Seminar —

Representation type of Jordan algebras

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Abstract

This a joint work with S. Ovsienko and I. Shestakov. The talk is devoted to the problem of the classification of indecomposable Jordan bimodules over finite dimensional algebras.

We assume the base field $\Bbbk$ to be algebraically closed and of characteristics $\neq 2, 3$. Recall that for a Jordan algebra $\mathcal{J}$ the category $\mathcal{J}$-bimod of $\Bbbk$-finite dimensional $\mathcal{J}$-bimodules is equivalent to the category $\mathrm{U}-$mod of (left) finitely dimensional modules over an associative algebra $\mathrm{U} = \mathrm{U}(\mathcal{J})$, which is called the universal multiplication envelope of $\mathcal{J}$. The algebra U is finite dimensional, provided that $\mathcal{J}$ is finite dimensional. It allows us to apply to the category $\mathcal{J}-$bimod all the machinery developed in the representation theory of finite dimensional algebras. In particular, in accordance with the representation type of the algebra U one can define Jordan algebras of the finite, tame and wild representation types. As in the case of associative algebra the distinction of the objects of finite and tame representation type is an interesting problem, especially because in these cases we can obtain a complete classification of finite dimensional bimodules over $\mathcal{J}$.

We introduce two new notions for Jordan algebras: a diagram and a tensor algebra of a module, which prove to be very useful. In particular, we classify half-unital (or one-sided) representation type for Jordan matrix algebras with radical square zero. The results obtained are similar to the corresponding classical results for associative algebras.

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4:45pm – 5:45pm
319 Jeffery Hall