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*Bounded weight modules of the Lie algebra of vector fields on the affine space*

In this talk we will discuss weight modules of the Lie algebra  $W_n$  of vector fields on  $\mathbb{C}^n$ . A classification of all simple weight modules of  $W_2$  with a uniformly bounded set of weight multiplicities is provided. To achieve this classification we introduce a new family of generalized tensor  $W_n$ -modules. This is a joint work with A. Cavaness.