Classifying the Minimal Varieties of Polynomial Growth
Antonio Giambruno, Daniela La Mattina, and Mikhail Zaicev

Abstract. Let $\mathcal{V}$ be a variety of associative algebras generated by an algebra with 1 over a field of characteristic zero. This paper is devoted to the classification of the varieties $\mathcal{V}$ which are minimal of polynomial growth (i.e., their sequence of codimensions growth like $n^k$ but any proper subvariety grows like $n^t$ with $t < k$). These varieties are the building blocks of general varieties of polynomial growth.

It turns out that for $k \leq 4$ there are only a finite number of varieties of polynomial growth $n^k$, but for each $k > 4$, the number of minimal varieties is at least $|F|$, the cardinality of the base field and we give a recipe of how to construct them.