

We are interested in describing all group gradings on simple Lie algebras over an algebraically closed field F , i.e., all vector space decompositions of the form $L = \bigoplus_{g \in G} L_g$ where L is a simple Lie algebra, G is a group, and $[L_g, L_h] \subset L_{gh}$ for all $g, h \in G$. In the case $\text{char} F = 0$, all gradings on the classical simple Lie algebras of the series A, B, C, D and on some exceptional simple Lie algebras have been classified as a result of efforts of many authors. Y. Bahturin, S. Montgomery and myself showed that, essentially, the same classification is valid for the Lie algebras A, B, C, D in the case $\text{char} F = p > 2$. Another important class of simple finite-dimensional Lie algebras in positive characteristic is the Lie algebras of Cartan type: Witt, special, Hamiltonian and contact. (Similar algebras also exist in zero characteristic, but they are infinite-dimensional.) Y. Bahturin, J. McGraw and myself have recently made progress in the classification of gradings on Lie algebras of Cartan type. The talk will be an overview of the classification results mentioned above.