Varieties of algebras with derivations

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Let A be an associative algebra over a field F of characteristic zero. If L is a Lie algebra over F acting on A by derivations, then such an action can be naturally extended to the action of its universal enveloping algebra $U(L)$ on A. In this case we refer to A as algebra with derivations or L-algebra. With these ingredients at hand one studies the polynomials in non-commuting variables $x^d = d(x)$, where $d \in U(L)$, vanishing in A, that is the differential identities of A.

If A is an L-algebra, then the class $\mathcal{V}$ of all L-algebras satisfying all the differential identities of A (and possibly some more) is called the variety of algebras with derivations generated by A and is denoted by $\mathrm{var}^L(A)$.

The purpose of this talk is to survey some recent results in this setting and comparing them with the classical ones.

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