Jordan mappings in rings and algebras

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Let R be an associative ring. For any $x, y \in R$, as usual the symbols $x \circ y$ and $[x, y]$ will denote the anti-commutator $xy + yx$ and commutator $xy - yx$ and called Jordan product and Lie product, respectively. Recall that a map f of a ring R into itself is said to be additive if $f(x + y) = f(x) + f(y)$ for all $x, y \in R$. An additive map $d : R \to R$ is called a derivation if $d(xy) = d(x)y + xd(y)$ holds for all $x, y \in R$. An additive map $d : R \to R$ is called a *Jordan derivation* if $d(x^2) = d(x)x + xd(x)$ holds for all $x \in R$. An additive map $x \mapsto x^*$ of R into itself is called an involution if (i) $(xy)^* = y^*x^*$ and (ii) $(x^*)^* = x$ hold for all $x, y \in R$. A ring equipped with an involution is known as a ring with involution or a $*$-ring. An additive map $d : R \to R$ is called a *Jordan* $*$*-derivation* if $d(x^2) = d(x)x^* + xd(x)$ holds for all $x \in R$.

In this talk, I will review some recent results of myself and collaborations in certain class rings involving these mappings. Moreover, some examples and counter examples will be discussed for questions raised naturally.

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