The inner automorphisms of a group $G$ can be characterized in a purely category-theoretic fashion, as those automorphisms of $G$ that can be extended, in a functorial manner, to all groups $H$ given with homomorphisms $G \to H$. (Unlike the group of inner automorphisms, the group of such systems of automorphisms is always isomorphic to $G$.) A similar characterization holds for inner automorphisms of an associative algebra $R$ over a field $K$.

If one substitutes “endomorphism” for “automorphism” in these considerations, then in the group case, the only additional example is the trivial endomorphism; but in the $K$-algebra case, an unfamiliar construction (known to functional analysts) also comes up.

The preprint also investigates some similar further cases, about which I will not have time to say much in the talk; in particular, derivations of associative algebras, and endomorphisms and derivations of Lie algebras. (Received August 24, 2008)