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Generalized symmetries and arithmetic applications

I'll explain how a representable comonad on the category of rings, or any other category of algebras, can be viewed as a system of generalized symmetries, and I'll review how certain exotic constructions in commutative algebra, namely Witt vectors, lambda-rings, and their variants, can be naturally understood in terms of generalized symmetries, especially nonlinear ones. This is largely the work of others. I'll then explain how this can be extended to non-affine schemes and some more recent applications in arithmetic algebraic geometry. If we view such applications as inevitable consequences of the generalized symmetries, it is natural to wonder about other generalized symmetries in the category of commutative rings but also generalized symmetries in other categories of algebras. I'll ask a number of questions in this direction.