SEIDON ALSAODY, Uppsala University
Algebras with Additional Structures via Torsors and Descent

Algebras (over commutative rings) with additional structure (such as a quadratic form or a certain decomposition) occur in various contexts. In terms of algebraic groups, this often translates to the automorphism group of the algebra being a closed subgroup of, or containing as a closed subgroup, the symmetry group of this additional structure. In such cases, a detailed understanding of the relation between these two structures can be obtained by descent methods; more precisely by studying torsors over quotients of algebraic groups.

I will report on some recent results illustrating how this is used to study the relations between different structures on algebras related to different exceptional groups. As it turns out, many classical algebraic concepts (such as triality and isotopy) fit nicely into this framework.