
SACHA IKONICOFF, University of Ottawa

Quillen-Barr-Beck cohomology of divided power algebras over an operad

Quillen-Barr-Beck cohomology of divided power algebras over an operad Divided power algebras are algebras equipped with additional monomial operations. They are fairly ubiquitous in the positive characteristic setting, and appear notably in the study of simplicial algebras, in crystalline cohomology, and in deformation theory. An operad is a device that encodes operations: there is an operad for associative algebras, one for commutative algebras, for Lie algebras, Poisson algebras, and so on. Each operad then comes with an associated category of algebras, and also with a category of divided power algebras.

The aim of this talk is to show how André-Quillen cohomology generalises to several categories of algebras using the notion of operad. We will introduce modules and derivations, but also representing objects for modules - known as the universal enveloping algebra - and for derivations - known as the module of Kähler differentials - which will allow us to build an analogue of the cotangent complex. We will see how these notions allow us to recover known cohomology theories on many categories of algebras, while they provide somewhat exotic new notions when applied to divided power algebras.

This is joint work with Martin Frankland and Ioannis Dokas.