

Supergeometry in the usual sense studies manifolds whose structure sheaf is a  $\mathbb{Z}^2$  - graded algebra. Sometimes one also would like to construct a manifold whose structure sheaf is a  $\mathbb{Z}^2$  - graded algebra together with an odd derivation of square zero (this is called homological vector field). For example, one can ask: what kind of geometric object corresponds to a differential  $\mathbb{Z}^2$  - graded algebra?

In my talk I will explain that this question is in general too complicated. However, one can introduce a certain class of filtered differential  $\mathbb{Z}^2$  - graded algebras which can be studied by means of derived algebraic geometry. If time permits, I will outline some applications to deformation theory in the  $\mathbb{Z}^2$  - graded case and supermoduli spaces arising in mathematical physics.