Mathematics, Statistics, and Computer Science **@ UIC**

Algebraic Topology Seminar

Duality and Tilting for Commutative DG Rings

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Abstract: We study super-commutative nonpositive DG rings. An example is the Koszul complex associated to a sequence of elements in a commutative ring. More generally such DG rings arise as semi-free resolutions of rings. They are also the affine DG schemes in derived algebraic geometry. The theme of this talk is that in many ways a DG ring A resembles an infinitesimal extension, in the category of rings, of the ring H^0(A).

I first discuss localization of DG rings on Spec(H^0(A)) and the cohomological noetherian property. Then I introduce perfect, tilting and dualizing DG A-modules. Existence of dualizing DG modules is proved under quite general assumptions. The derived Picard group DPic(A) of A, whose objects are the tilting DG modules, classifies dualizing DG modules. It turns out that DPic(A) is canonically isomorphic to DPic(H^0(A)), and that latter group is known by earlier work. A consequence is that A and H^0(A) have the same (isomorphism classes of) dualizing DG modules.

Friday, October 24 at 2:00 PM in SEO 1227