

המחלקה למתמטיקה, בן-גוריון

גאומטריה אלגברית ותורת המספרים

ביום רביעי, 7 בדצמבר, 2016

בשעה 15:10 – 16:30

ב-101 Math

ההרצאה

Commutative of Sheaves of Category Derived The Rings DG

תינתן על-ידי

(BGU) Yekutieli Amnon

תקציר:



Ben Gurion University - Mathematics
Algebraic Geometry and Number Theory Seminar

Speaker **Amnon Yekutieli (BGU)**

Title **The Derived Category of Sheaves of Commutative DG Rings (abstract)**

Date Wednesday, 7 December 2016

Time 15:10 - 16:30 (starts 15:10 sharp)

Location Room -101 in Building 58

In modern algebraic geometry we encounter the notion of derived intersection of subschemes. This is a sophisticated way to encode what happens when two subschemes Y_1 and Y_2 of a given scheme X intersect non-transversely. The classical intersection multiplicity can be extracted from the derived intersection.

When the ambient scheme X is affine, it is not too hard to describe the derived intersection, by taking flat DG ring resolutions of the structure sheaves of the subschemes Y_1 or Y_2 . This also works when the scheme X is quasi-projective. However, derived intersections in more general schemes X could only be treated using the very difficult homotopical methods of derived algebraic geometry .

Several months ago I discovered a "cheap" way to construct flat resolutions of sheaves of rings. The resolutions are by semi-pseudo-free sheaves of DG rings. The main advantage is that the geometry does not change: all the action takes place on the original topological space X .

Abstract

Using semi-pseudo-free resolutions it is possible to produce derived intersections as above. It is also possible to get a direct presentation of the cotangent complex of a scheme (at least in characteristic 0). Presumably the derived adic completion of Shaul, so far studied only in the affine case, can be globalized using our methods.

Lastly, the semi-pseudo-free resolutions give rise to a congruence on the category of sheaves of commutative DG rings on a space X , that we call relative quasi-homotopy. The functor from the homotopy category to the derived category turns out to be a faithful right Ore localization. This fact gives tight control on the derived category. It should be noted that in this situation there does not seem to exist a Quillen model structure, so the traditional approaches would fail.

In the talk I will explain the various ideas listed above. More details can be found in the eprint [arxiv:1608.04265](https://arxiv.org/abs/1608.04265).