Department of Mathematics, BGU

Algebraic Geometry and Number Theory

On *Wednesday, December ,13 2017*

At *15:10 – 16:30*

In *Math 101-*

Dmitry Kerner (BGU)

will talk about

Discriminant of the ordinary transversal singularity type

Abstract: Singular spaces appear everywhere. And the singularity is often non-isolated, i.e. the singular locus is of positive dimension. These non-isolated singularities are more complicated and less studied.

Let X be a variety with singular locus Z, the simplest example being the surface {y^2=x^2z}. Generically along Z the singularity "factorizes", i.e. X is locally at each point the product: (the germ of Z)\times (the germ of space with an isolated singularity).

But at some special points of Z the picture degenerates and the family of sections of X, transversal to Z, becomes not equi-singular (in whichever sense). These points form the discriminant of transversal singularity type. We study

this discriminant, assuming X,Z are locally complete intersections and X is of “ordinary type” generically along Z.

First I will define the discriminant, as a subscheme of Z, and formulate its properties. This discriminant is a (effective) Cartier divisor in Z, nef but not necessarily ample, with nice pullback/pusfhorward properties under some maps. The discriminant deforms flatly under some deformations of X.

Then I will give the formula for the class of this discriminant in the cohomology/Chow group/Picard group of Z. This class “counts the number of points” where the transversal type degenerates as one travels along the singular locus. In most cases this class is not zero (when Z is complete or projective). This places a “topological” obstruction to the naive expectation (from dffierential geometry): “In the generic case the transversal type does not degenerate”.

The talk is based on arXiv:1705.11013 and arXiv:1308.6045.