Department of Mathematics, BGU

Algebraic Geometry and Number Theory

On *Wednesday, May ,13 2015*

At *15:00 − 16:30*

In *Math 201*

Gal Binyamini (University of Toronto)

will talk about

Counting solutions of dffierential equations and diophantine consequences

Abstract: We consider the following problem: given a set of algebraic conditions on an n-tuple of functions and their first l derivatives, admitting finitely many solutions (in a dffierentiably closed field), can one give an upper bound for the number of solutions? I will present estimates in terms of the degrees of the algebraic conditions, or more generally the volumes of their Newton polytopes (analogous to the Bezout and BKK theorems). The estimates are singly-exponential with respect to n,l and have the natural asymptotic with respect to the degrees or Newton polytopes, sharpening previous doubly-exponential estimates due to Hrushovski and Pillay. No familiarity with dffierential algebra will be assumed. As an application, I will sketch how this result can be applied to

deduce similar estimates for the number of transcendental lattice points on algebraic subvarieties of complex tori and abelian varieties, following Hrushovski and Pillay. If time permits I will also mention an application to counting the number of intersections between isogeny classes of elliptic curves and algebraic varieties, following Freitag and Scanlon.

Please Note the Unusual Time and Place!