מכון ויצמן למדע

THE WEIZMANN INSTITUTE OF SCIENCE

FACULTY OF MATHEMATICS AND COMPUTER SCIENCE

Seminar in Geometry and Topology

Room 1 ,Ziskind Building
on Tuesday, Jun 11, 2019
at 16:15

Gal Binyamini
Weizmann

Point counting for foliations over number fields

Abstract:

We consider an algebraic variety V and its foliation, both defined over a number field. Given a (compact piece of a) leaf L of the foliation, and a subvariety W of complementary codimension, we give an upper bound for the number of intersections between L and W. The bound depends polynomially on the degree of W, the logarithmic height of W, and the logarithmic distance between L and the locus of points where leafs of the foliation intersect W improperly.
Using this theory we prove the Wilkie conjecture for sets defined using leafs of foliations under a certain assumption about the algebraicity locus. For example, we prove the if none of the leafs contain algebraic curves then the number of algebraic points of degree d and log-height h on a (compact piece of a) leaf grows polynomially with d and h. This statement and its generalizations have many applications in diophantine geometry following the Pila-Zannier strategy.

I will focus mostly on the proof of the main statement, which uses a combination of differential-algebraic methods related to foliations with some ideas from complex geometry and value distribution theory. If time permits I will briefly discuss the applications to counting algebraic points and diophantine geometry at the end.

Email: hanni.naor@weizmann.ac.il * Phone: (08)9343349 * Fax: (08)9344308