



THE WEIZMANN INSTITUTE OF SCIENCE
FACULTY OF MATHEMATICS AND COMPUTER SCIENCE

Seminar in Geometry and Topology

Room 155 ,Ziskind Building
on Monday, Jan 13, 2020
at 09:15

Beatriz Molina Samper

Newton non-degenerate codimension one foliations and blowing-ups

Abstract:

In this talk we introduce Newton non-degenerate codimension one foliations, that are given in terms of Newton polyhedra following the classical ideas of Kouchnirenko for hypersurfaces. We characterize Newton non-degenerate foliations in geometrical terms, as being foliations admitting a reduction of singularities of a combinatorial nature, the ones that we call (weak) toric type foliations. In addition, we provide a positive answer to Thom's question about the existence of invariant hypersurface for germs of codimension one foliations, in the three-dimensional case of toric type. In order to do it, we pass through a study of global character in dimension two. The Khovanskii-Kouchnirenko-Bernstein result that relates the number of solutions of a Laurent polynomial system in terms of the mixed volume of the associated polyhedra, leads us to conclude that isolated branches of Newton non-degenerate foliations defined over projective toric surfaces extend in a global way. This prolongation property is the key to spread the invariant surfaces in dimension three through the compact dicritical components.