Representation Theory, Geometry & Combinatorics Seminar

Organizer: M. Haiman and N. Reshetikhin

Wednesday, 4:00–6:00pm, 939 Evans

Oct. 21 **Mauricio Velasco**, UCB

Two results on the Cox rings of rational varieties

The Cox ring of an algebraic variety X fits in the following analogy: $\mathrm{Cox}(X)$ is to X as the ring of polynomials $k[x_0, .., x_n]$ is to projective space P^n. It is known that the Cox ring of X is a polynomial ring if and only if X is Toric and that there is a large class of varieties, the so called Mori Dream Spaces, whose Cox rings are finitely generated algebras.

I am interested in the following two questions:

1. Which algebraic varieties are Mori dream spaces?

2. How to construct presentations for the Cox rings of Mori Dream Spaces?

In this talk I will describe recent progress in these two questions for some rational varieties: a Theorem stating that every rational surface with Big anticanonical divisor is a Mori Dream Space (with D. Testa and A. Varilly-Alvarado) and work (with B. Sturmfels) on the defining ideals of the Cox rings of blow-ups of P^n at $n+3$ general points and its relationship with spinor varieties generalizing work of Serganova and Skorobogatov on Del Pezzo surfaces.