

1135-05-1385

**Carolina Benedetti V.\*** ([c.benedetti@uniandes.edu.co](mailto:c.benedetti@uniandes.edu.co)). *Combinatorial aspects of Non-crossing and R-polytopes*. Preliminary report.

N. Thieme defined unipotent polytopes  $U(\beta, P)$  in connection to certain representations of the unipotent group of upper triangular matrices over a finite field. In this talk we will define two subpolytopes of  $U(\beta, P)$  where  $P$  is the line poset on  $[n]$  and  $\beta$  is the composition  $(1^n)$ . These two subpolytopes denoted  $NC$  and  $NN$  arise as the convex hull of non-crossing and non-nesting partitions of  $[n]$ , respectively. The  $NN$  polytope corresponds to Stanley's chain polytope of the root lattice of type A. As such, some of its combinatorics is understood but not all. In particular we will provide a description of its 1-skeleton and extend this description to  $NC$ . Moreover, we will show how  $NC$  and  $NN$  can be thought of as  $R$ -polytopes (i.e. as polytopes arising from relations on a finite set) and characterize different types of faces for  $R$ -polytopes in general. This is joint work with F. Alinieifard, N. Bergeron, S. Li, F. Saliola. (Received September 21, 2017)