
THE WEIZMANN INSTITUTE OF SCIENCE
FACULTY OF MATHEMATICS AND COMPUTER SCIENCE
Algebraic Geometry and Representation Theory Seminar

Room 155 ,Ziskind Building
on Tuesday, Sep 24, 2019at 11:15

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Noncommutative Catalan numbers

Abstract:

The goal of my talk (based on joint work with Vladimir Retakh) is to introduce noncommutative analogs of Catalan numbers c_n which belong to the free Laurent polynomial algebra L_n in n generators. Our noncommutative Catalan numbers C_n admit interesting (commutative and noncommutative) specializations, one of them related to Garsia-Haiman (q,t) -versions, another -- to solving noncommutative quadratic equations. We also establish total positivity of the corresponding (noncommutative) Hankel matrices H_n and introduce two kinds of noncommutative binomial coefficients which are instrumental in computing the inverse of H_n and its positive factorizations, and other combinatorial identities involving C_n .

If time permits, I will explain the relationship of the C_n with the:

1. noncommutative Laurent Phenomenon, which was previously established for Kontsevich rank 2 recursions and all marked surfaces
2. noncommutative orthogonal polynomials, which can be viewed as noncommutative determinants of an extended matrix H_n .