

Q-CONES: A TOY EXAMPLE ON COMBINATORICS
AND TOPOLOGY OF SIMPLICIAL COMPLEXES

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One of the main tools to study the combinatorics of simplicial complexes is, the so called, the f -vector of such complexes which contains all information about the number and the dimension of the faces in the complexes.

In this talk we want only to point out that certain iterative constructions on Geometry and Topology, the so called joins of complexes, can be codified by means of very simple Riordan matrices, if we start at suitable initial conditions. So, we obtain that the Riordan pattern is not only in counting faces but also in computing the reduced Betti numbers of the corresponding polyhedra.

We want also to show a combinatorial property for q -cones which is analogous to the Euler characteristic and whose invariance in the appropriate framework is completely proved by Riordan matrices methods.

Along the talk and if the time permits, we will comment how Riordan matrices are involved in many results in the Combinatorics (and Topology) of simplicial complexes. For example, how to pass from f -vectors to the so called h -vectors, the re-interpretation of the Dehn-Sommerville equations, etc.