

COMBINATORIAL COMMUTATIVE ALGEBRA AND TOPOLOGY OF MOMENT-ANGLE COMPLEXES

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One of the most important objects of study in toric topology is a moment-angle complex \mathcal{Z}_K associated to any simplicial complex K on m vertices, that is, a finite CW complex in a unitary m -disk $(\mathbb{D}^2)^m \subset \mathbb{C}^m$, with a natural m -dimensional torus action.

It was proved to be a topological manifold in the case of K being a homology sphere, moreover, it is a smooth manifold for K being a sphere triangulation. The topological structure of \mathcal{Z}_K in general is far from being well understood.

In my talk I will introduce some of my recent results, relating the combinatorial commutative algebra of the complex K , or that of its Stanley–Reisner ring $\mathbf{k}[K]$, to the topology of \mathcal{Z}_K and the properties of its integral cohomology ring. These observations will be treated in the context of several known results.

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