

SEMINARIO

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On the Euler characteristic of a complete intersection in terms of the Newton polyhedra

Abstract: A well-known formula for the Euler characteristic of the complete intersection $\{f_1 = \dots = f_s = 0\}$ in the complex torus $(\mathbb{C})^n$ in terms of the supports of Laurent polynomials $f_1, \dots, f_s$ (or, in fact, in terms of their convex hulls: the Newton polyhedra) was announced in a paper by D.N. Bernshtein, A.G. Kushnirenko, and A.G. Khovanskii: Russian Mathematical Surveys, 1976. There, it was indicated that (in the general case) it was proved by D. Bernshtein. However, that was the last published by Bernstein paper on topology of submanifolds in the torus $(\mathbb{C})^n$ in terms of Newton polyhedra and the proof of the mentioned equation appeared later in a paper by A. Khovanskii from 1978. This proof was not self-contained (it was essentially based on results of a paper by F. Ehlers from 1975) and was somewhat fragmentary.

However, there exists a somewhat elementary (modular usual properties of toric compactifications) proof of the equation. We shall discuss this "elementary" proof based on the simplest properties of toric manifolds.

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