

# **Mixed multiplicities of ideals and mixed volumes of polytopes**

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Abstract: The main results interpret mixed volumes of lattice polytopes as mixed multiplicities of ideals and mixed multiplicities of ideals as Samuel's multiplicities. In particular, we can give a purely algebraic proof of Bernstein's theorem which asserts that the number of common zeros of a system of Laurent polynomial equations in the torus is bounded above by the mixed volume of their Newton polytopes.