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Lei Xue* (lxue@uw.edu). *A Proof of Grünbaum's Lower Bound Conjecture for general polytopes, and strongly regular CW spheres.* Preliminary report.

In 1967, Grünbaum conjectured that any d -dimensional polytope with $d + s \leq 2d$ vertices has at least

$$\phi_k(d + s, d) = \binom{d + 1}{k + 1} + \binom{d}{k + 1} - \binom{d + 1 - s}{k + 1}$$

k -faces. In the talk, we will discuss the proof of this conjecture and also characterize the cases in which equality holds. Our results extend to strongly regular CW spheres. We will also talk about recent results on d -dimensional polytopes with $2d + 1$ or $2d + 2$ vertices. (Received March 08, 2021)