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**Fabrizio Zanello\*** ([zanello@math.mit.edu](mailto:zanello@math.mit.edu)), Department of Mathematical Sciences, Michigan Tech, Houghton, MI 49931-1295. *Some old and new (non)unimodality results.*

Asking whether a given sequence is unimodal is often a central question in combinatorics and combinatorial commutative algebra. Just recently, this question has been the object of a considerable amount of research, which has seen the most exciting breakthrough in the work of Huh and Huh-Katz on the unimodality of the face vectors of representable matroids. I will review a number of results and open problems on unimodal sequences, from Stanley's original proof of the nonunimodality of Gorenstein Hilbert functions, to my 2006 result on level algebras, to the recent progress contained in the pure  $O$ -sequences memoir. In the last portion of the talk, I will outline a proof that even the face vectors of Cohen-Macaulay simplicial complexes can be nonunimodal with arbitrarily many peaks, a fact that improves several previous results in this area. (Received July 23, 2012)