interesting polynomials.
I present explicit Waring decompositions of two polynomials relevant to the complexity of matrix multiplication: the three by three determinant polynomial and the symmetrized matrix multiplication tensor corresponding to multiplication of three by three matrices. The decompositions are each of size 18 and are valid over fields containing a third root of unity. Furthermore, I present a border Waring rank decomposition of $\operatorname{det}_{3}$ of size 17, which is optimal. This talk discusses joint work with JM Landsberg, Fulvio Gesmundo, Emanuele Ventura, and Amy Huang. (Received March 09, 2021)

