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Adriana Salerno* (asalerno@bates.edu) and **Ursula Whitcher**. *Hasse-Witt matrices and mirror toric pencils.*

Mirror symmetry predicts unexpected relationships between arithmetic properties of distinct families of algebraic varieties. For example, Wan and others have shown that for some mirror pairs, the number of rational points over a finite field matches modulo the order of the field. In this talk, we obtain a similar result for certain mirror pairs of toric varieties. We use recent results by Huang, Lian, Yau and Yu describing the relationship between the Picard-Fuchs equations and the Hasse-Witt matrix of these varieties, which encapsulates information about the number of points. The result allows us to compute the number of points modulo the order of the field explicitly, and we illustrate this by computing K3 surface examples related to hypergeometric functions. (Received September 12, 2019)