1145-13-2887 **Davis Deaton*** (davis.deaton@pop.belmont.edu) and **Jordan Sawdy** (jordan.sawdy@pop.belmont.edu). *Unstacking Tortoise Shells with Math: Factoring Multivariate Polynomials in the Tropical Semiring.* Preliminary report.

The real numbers endowed with the operations of min and + form an idempotent semiring referred to as the Tropical Semiring. Factorizations of the multivariate polynomials over this semiring are not unique. Our goal is to provide an algorithm to produce all the factorizations of any given multivariate tropical polynomial. To do so, we associate each polynomial with a polyhedral complex such that multiplication of the polynomials corresponds to Minkowski addition of the complexes. We use a dual complex to describe each factor as a polyhedral complex satisfying a certain zero tension condition. This condition allows us to frame the irreducible factors as the Hilbert basis of a system of Diophantine linear equalities, which can be computed using known algorithms. These irreducible factors are then easily stitched together to form all possible factorizations. (Received September 25, 2018)