1154-05-162 **Colin Defant*** (`cdefant@princeton.edu`). *Duluthian Developments in the Anti-Powerful Words World.*

Four years ago, Fici, Restivo, Silva, and Zamboni defined a k-anti-power to be a word of the form $w^{(1)} \cdots w^{(k)}$, where $w^{(1)}, \ldots, w^{(k)}$ are distinct words that have the same length. Since then, anti-powers have received vigorous attention, most of which has spawned from the Duluth REU Program. In this talk, we survey these Duluthian developments and highlight some unsolved mysteries. We begin with my own work on anti-power prefixes of the Thue-Morse word, which was subsequently extended by Narayanan and generalized to "j-fixes" by Gaetz. Our journey continues with the work of Burcroff, who generalized the notion of an anti-power to that of a "block-pattern" and extended many of Fici, Restivo, Silva, and Zamboni's results to that setting. Finally, we explore my work with Berger, in which we settle one of Fici, Restivo, Silva, and Zamboni's open problems. Namely, we prove that 5 is the largest integer κ such that every aperiodic recurrent word contains a κ-anti-power. We pose a conjecture about the lengths of anti-powers appearing in morphic words, which we have proven for binary words generated by uniform morphisms. Garg has removed the hypothesis that these words are binary, and he has also proven our conjecture for the Fibonacci word. (Received August 16, 2019)