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**Robert Davis\*** (davisr@math.msu.edu), Department of Mathematics, Michigan State University, 619 Red Cedar Rd., East Lansing, MI 48824, and **Bruce Sagan**. *A Polyhedral Proof of a Wreath Product Identity*. Preliminary report.

In 2013, Beck and Braun proved and generalized multiple identities involving permutation statistics via discrete geometry. Namely, they recognized the identities as specializations of integer point transforms for certain polyhedral cones. They extended many of their proof techniques to obtain identities involving wreath products, but some identities were resistant to their proof attempts. In this talk, we provide an entirely geometric justification of the identity

$$\sum_{k \geq 0} ([k + 1]_q + u[r - 1]_u [k]_q)^n t^k = \frac{\sum_{(\epsilon, \pi) \in \mathbb{Z}_r \wr \mathfrak{S}_n} q^{\text{maj}(\epsilon, \pi)} t^{\text{des}(\epsilon, \pi)} u^{\text{col}(\epsilon, \pi)}}{\prod_{j=0}^n (1 - tq^j)}$$

for fixed positive integers  $r$  and  $n$ , first established by Biagioli and Zeng. (Received August 17, 2017)