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Tobias L Johnson* (tobias.l.johnson@gmail.com) and **Joshua Zahl** (josh@caltech.edu).

Universal Cycles of Multisets. Preliminary report.

Consider the collection of all t -multisets of $\{1, \dots, n\}$. A *universal cycle on multisets* is a string of numbers, each of which is between 1 and n , such that if these numbers are considered in t -sized windows, every multiset in the collection is present in the string precisely once. The past 15 years have seen a surge of interest in this area, primarily due to Chung, Diaconis, and Graham's 1992 paper on universal cycles on sets. For the case $t = 3$, we describe the conditions for which universal cycles on multisets exist, giving two distinct proofs. (Received September 13, 2006)