1154-05-731 **Amelia Cantwell*** (cantwellamelia@gmail.com) and **Juliann Geraci**. *Graph Universal Cycles of Combinatorial Objects.* Preliminary report.

In 1992, Chung et al. showed that while the set of permutations on $[n]$ could not be placed into a universal cycle, there are ways to circumvent this issue, by enhancing the set of symbols. In the same paper, and in 1994 by Hurlbert, the question of universal cycles of k-subsets of $[n]$ is addressed, with definitive results only for $k = 3, 4, 6$. Finally, Chung et. al prove the existence of universal cycles for partitions of an n-element set but with the number of symbols being unspecified.

We will describe a new method of producing universal cycles of these objects. Inspired by Brockman et al. (2010), where *graph universal cycles* are introduced, we use these in our various contexts. For S_n, we will show that the set of *permutation graphs* of elements of S_n can be placed in a graph universal cycle. Moreover, the set of *transposition graphs* of all involutions on n elements can also be placed in a graph universal cycle. For k-subsets of $[n]$, we use the complete graph and the n-cycle as our parent graphs to exhibit graph universal cycles. Finally, disjoint unions of complete graphs are used as starting points for graph universal cycles of set partitions. (Received September 10, 2019)