1143-05-511 **John Engbers** (john.engbers@marquette.edu), **David Galvin** (david.galvin.12@nd.edu) and **Clifford Smyth*** (cdsmyth@uncg.edu). *Combinatorial formulas for restricted Stirling and Lah number matrices and their inverses.*

Given a set R of natural numbers let S(n,k,R) be the restricted Stirling number of the second kind: the number of ways of partitioning a set of size n into k non-empty subsets with the sizes of these subsets restricted to lie in R. Let S(R) be the matrix with S(n,k,R) in its (n,k) entry. If R contains 1, S(R) has an inverse T(R) with integer entries. We find that for many R the entries T(n,k,R) of T(R) are expressible (up to sign) as the cardinalities of explicitly defined sets of trees and forests. For example this is the case when R has no exposed odds, i.e. R contains 1 and 2 and R never contains an odd number n greater than 1 without also containing n+1 and n-1. We have similar results for restricted Stirling numbers of the first kind (partitions into cycles) and Lah numbers (partitions into ordered lists). Our proofs depend in part on a combinatorial formula for the coefficients of the compositional inverse of a power series that expresses each coefficient as a sum of weighted trees. (Received August 21, 2018)