Modular Leech trees

David Leach, University of West Georgia

In 1975 John Leech asked when can the edges of a tree on n vertices be labeled with positive integers such that the sums along the paths are exactly the integers $1, 2, \ldots, \binom{n}{2}$. He found five such trees, and no additional trees have been discovered since. In 2009 Leach and Walsh introduced the idea of labeling trees with elements of the group $\mathbb{Z}_k$ where $k = \binom{n}{2} + 1$ and examined the cases for $n \leq 6$. In this talk we will look at some necessary conditions for the existence of modular leech trees and specifically at the case where $n = 8$.