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Megan Owen* (maowen@ncsu.edu) and **J. Scott Provan**. *A Fast Algorithm for Computing Geodesic Distances in Tree Space*.

In 2001, Billera, Holmes, and Vogtmann constructed a geometric space of phylogenetic trees, which has the same combinatorial structure as the tropical tree space (the tropical Grassmannian), but a different metric. In their space, there is a unique shortest path between any two points (trees), and the length of this path is called the geodesic distance between phylogenetic trees. However, the complexity of computing this distance is an open problem. In this talk, I will give a polynomial time algorithm for finding the geodesic distance. This algorithm starts with a simple initial path and moves through a series of successively shorter paths until the geodesic is attained. I will also discuss connections to the tropical tree space. (Received August 25, 2009)