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**Stefan Forcey\*** (sforcey@uakron.edu), **Logan Keefe** and **William Sands**. *Facets of Balanced Minimal Evolution polytopes*.

I'll review how the balanced minimal evolution (BME) method reconstructs a phylogenetic tree from a given distance matrix, by performing the simplex algorithm for a simple example. New and improved algorithms might be available if we had enough facets of the BME polytope in order to pose a relaxed linear programming problem. So far we have found all the facets up to dimension 5 and several classes of large facets that extend to all dimensions. We'll go over facets from caterpillars, necklaces, intersecting cherries, and big splits. We'll mention some interesting connections to matching polytopes like the Birkhoff polytope, and list some open questions about counting and geometry. (Received August 07, 2015)