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Karen Vogtmann* (kvogtmann@gmail.com). *The geometry of Outer space.*

Outer space was introduced in the early 1980's as a tool for studying the group $Out(F_n)$ of outer automorphisms of a finitely-generated free group. It is a contractible space on which $Out(F_n)$ acts with finite stabilizers, and can be thought of as analogous to a symmetric space (with the action of a non-uniform lattice) or the Teichmüller space of a surface (with the action of the mapping class group of the surface). Much progress has been made on understanding the topology of Outer space and of its quotient by $Out(F_n)$, but its geometry was largely unexplored until recently. Now through the efforts of many people a metric theory is emerging, resulting in new information about $Out(F_n)$ as well as elegant new proofs of older results, and strengthening the analogy between the classical theories of symmetric spaces and Teichmüller spaces. I will describe the basics of this theory, then focus on some striking recent work of Bestvina-Feighn and Handel-Mosher, who use this new geometry to prove that certain simplicial complexes naturally associated to free groups have negative curvature in the sense of Gromov. (Received September 17, 2013)