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**Bilal Khan\*** ([grouptheory@hotmail.com](mailto:grouptheory@hotmail.com)), Dept of Mathematics and Computer Science, Room 4234N, 899 Tenth Avenue, New York, NY 11222. *On the local and global structure of the automorphism graph of a free group.* Preliminary report.

The automorphism graph of a group  $G$  is a graph whose vertices are the conjugacy classes of  $G$ , in which two vertices are connected by an edge iff they are related by one of a chosen set of generators of  $\text{Aut}(G)$ . We describe the asymptotic structure and components of the automorphism graph of a free group, and show that when the group has rank 2, the graph is a hyperbolic metric space in the sense of Gromov. We discuss obstacles to an analogous argument for the case of free groups of rank  $> 2$  and illustrate how characterizations of the structure of the graph can be translated into the design of efficient new algorithms for automorphic conjugacy. (Received August 16, 2005)