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When a group is given by a finite set generators, we can choose a so-called “language of normal forms”, that is, a set of unique representatives (words in the generators) for the elements of the group. Attempts to classify groups according to whether they admit a language of normal forms with a given complexity have proved fruitful and interesting – such work includes the study of automatic groups, combable groups, groups with normal forms of geodesics which are regular, context-free or counter, and groups with finite confluent rewriting systems. In this talk we describe some work in progress investigating the question of which groups have languages of normal forms which are computable in logspace. In other words, we attempt to describe those groups with normal forms that can be calculated using a Turing machine in which the size of the work space is logarithmic in the size of the input word. Despite this powerful restriction on the power of the Turing machine, a rich and interesting class of groups appears to emerge. (Received March 30, 2010)