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Pete Goetz* (pdg11@humboldt.edu). *The Cohomology of the “Group Of Loops”, Preliminary Report.*

In this talk I will discuss a group that can be studied from the point of view of combinatorial group theory, topology, and algebra. Fix a positive integer n and let G be the group with generators a_{ij} , $1 \leq i \neq j \leq n$ and relations

$$[a_{ij}, a_{kj}], [a_{ij}, a_{ik}a_{jk}], [a_{ij}, a_{kl}]$$

where i, j, k, l are distinct and $[x, y]$ denotes the group commutator. This group has many manifestations and I will begin by discussing some areas (combinatorial group theory, topology) in which it arises. In 1993, Brownstein and Lee conjectured a presentation for the rational cohomology algebra, $H^*(G, \mathbb{Q})$. Jensen, McCammond, and Meier proved the conjecture in 2006. In the second part of my talk, I will discuss some progress of myself and Andrew Conner on proving the Koszulity of the algebra $H^*(G, \mathbb{Q})$. An exciting recent development is that $H^*(G, \mathbb{Q})$ is a quotient of the enveloping algebra of a certain Lie algebra related to the Yang-Baxter equation defined by Bartholdi, Enriquez, Etingoff, and Rains. (Received July 19, 2011)