

Meeting: 1005, Newark, Delaware, SS 1A, Special Session on Homotopy Theory (in Honor of Donald M. Davis's and Martin Bendersky's 60th Birthdays)

1005-55-167 **F. R. Cohen*** (cohf@math.rochester.edu), Department of Mathematics, University of Rochester, Rochester, NY 14627, and **J. Wu** (matwuj@nus.edu.sg), Department of Mathematics, National University of Singapore, Singapore, Singapore. *Experiments with simplicial groups*. Preliminary report.

The purpose of this talk is to consider connections between the simplicial group $F[S^1]$, Milnor's free group for the simplicial circle, and AP_* a simplicial group which in degree n is P_{n+1} , the $(n+1)$ -st pure braid group. An embedding $F[S^1] \rightarrow AP_*$ was given in [math.AT/0409307](#). There are classical maps of P_{2g+1} to Γ_g , the mapping class group for genus g surfaces. It is the purpose of this talk to consider the composites of these two maps, and natural functions defined on these simplicial groups. Let $Sym^n(M)$ denote the n -th symmetric power of the abelian group M .

Proposition 1: The composite $F_2 \rightarrow P_3 \rightarrow SL(2, \mathbb{Z}) \rightarrow PSL(2, \mathbb{Z})$ is an isomorphism onto the principal congruence subgroup of level 2.

One remark is that representatives of $H^*(F_2; Sym^2(\oplus_2 \mathbb{R}))$ distinguish multiples of the classical Hopf map $S^3 \rightarrow S^2$.

Proposition 2: If $g \geq 1$, and $n \geq 2$, there is torsion of arbitrarily large order in $H^*(F_{2g}; Sym^n(\oplus_{2g} \mathbb{Z}))$. (Received February 08, 2005)