Meeting: 999, Nashville, Tennessee, SS 10A, Special Session on Geometry of Hyperbolic Manifolds

999-57-272 **Marc Culler*** (culler@math.uic.edu), Dept. of Mathematics (M/C 249), University of Illinois at Chicago, Chicago, IL 60607-7045, and **Peter B. Shalen**. *Hyperbolic volume and mod 2 homology, Part II.* Preliminary report.

This talk will discuss the proof of the following topological theorem which has applications to volumes of hyperbolic 3-manifolds (see Peter Shalen's abstract for part I).

Theorem. Let M be a closed, orientable, irreducible 3-manifold such that $H_1(M;\mathbf{Z}/2\mathbf{Z}$ has rank at least 7 and $\pi_1(M)$ has no rank-2 free abelian subgroup. Suppose that $\pi_1(M)$ contains a freely indecomposable subgroup of rank 3. Then some 2-sheeted covering space M_1 of M contains a compact (possibly disconnected) 3-dimensional submanifold X such that (i)∂X is incompressible, (ii) $-4 \leq \chi(X) \leq -2$, and (iii) $\chi(\overline{X - \Sigma}) \leq -2$, where Σ denotes the characteristic submanifold of X relative to ∂X. (Received August 24, 2004)