

**Columbia University  
Department of Mathematics  
Spring 2008**

# **Joseph Fels Ritt Lectures**

**David Gabai  
Princeton**

**Tuesday, May 6**

**Volumes of Hyperbolic 3-Manifolds**

**We will outline a proof that the Weeks manifold is the unique lowest volume closed orientable hyperbolic 3-manifold and address the Thurston, Weeks, Matveev-Fomenko conjecture that among the low volume hyperbolic 3-manifolds, there is a close relation between volume and combinatorial/topological complexity. (Joint work with Peter Milley and Robert Meyerhoff.)**

**Wednesday, May 7**

**Heegaard Splittings of 3-Manifolds**

**Heegaard structures (i.e. decompositions of closed 3-manifolds into two genus- $g$  handlebodies) have been studied for over a hundred years, using techniques from many fields such as Riemannian and hyperbolic geometry, number theory, dynamics, Teichmüller theory, foliation/lamination theory, combinatorics and of course 3-manifold topology. This survey lecture will discuss some classical and modern results in this rapidly developing subject.**

**312 Mathematics Building  
4:00 p.m. Both days**

**Tea will be served at 3:15 p.m. 508 Mathematics Building - Both days**