

## **A Parameter Space for Potential Small Cusped Hyperbolic 3-Manifolds**

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This is joint work (in progress) with D. Gabai and N. Thurston. We are primarily interested in small-volume cusped hyperbolic 3-manifolds, but expand our attention to cusped hyperbolic 3-manifolds with small maximal cusp area. Our foundational tool for finding cusped manifolds with small maximal cusp area is a certain 6-dimensional (real) parameter space in which 3 of the parameters describe the shape and size of the maximal cusp torus. The points in this parameter space correspond to subgroups of  $\mathrm{PSL}(2, \mathbb{C})$  which may or may not be discrete. We use the computer to determine that huge numbers of these points correspond to indiscrete groups. Our current method for analyzing the points that are not eliminated from consideration by this method is intriguing and ongoing, and involves hyperbolic necklaces---chains of abutting horoballs.