

TRIANGULATIONS AND 3-DIMENSIONAL MANIFOLDS
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Thurston in his revolutionary work starting in the 1970s pioneered the use of software and experimentation in the study of 3-dimensional manifolds. Thurston showed that hyperbolic metrics could be constructed by deforming the shapes of tetrahedra to solve gluing equations. Powerful software (SNAPPEA, REGINA etc) is very successful at searching amongst a huge number of triangulations, but we do not understand how to systematically find good triangulations for which the gluing equations have solutions corresponding to positively oriented tetrahedra. I will describe joint work on a linearised version of the gluing equations, where the problems are more tractable and progress has been made. This has also proved useful in establishing that a new class of invariants of 3-manifolds coming from string theory are well defined.

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