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**Gaven J. Martin\*** ([g.j.martin@massey.ac.nz](mailto:g.j.martin@massey.ac.nz)). *Siegel's problem on small volume lattices.*

We outline in very general terms the history and the proof of the identification of the minimal covolume lattice of hyperbolic 3-space as the 3-5-3 Coxeter group extended by the involution preserving the symmetry of this diagram. This gives us the smallest regular tessellation of hyperbolic 3-space.

This solves (in three dimensions) the problem posed by Siegel in 1945 (Siegel solved this problem in two dimensions by deriving the Signature formula identifying the (2,3,7)-triangle group as having minimal co-area).

There are strong connections with arithmetic hyperbolic geometry in The proof and the result has applications in the maximal symmetry groups Of hyperbolic 3-manifolds (in much the same way that Hurwitz 84g-84 theorem and Siegel's result do). (Received June 23, 2016)