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Constant mean curvature foliations of almost-Fuchsian manifolds

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Quasi-Fuchsian groups have been objects of extensive study since the 1890s. By naturally acting on the 3-dimensional hyperbolic space, they describe a wide class of complete, infinite volume, hyperbolic 3-manifolds, and their properties play a crucial role in Thurston's hyperbolization theorem and, more generally, in the study of the geometry and topology of 3-manifolds. Following Uhlenbeck, we say that a quasi-Fuchsian manifold is almost-Fuchsian if it contains an incompressible minimal surface with principal curvatures between -1 and 1. A conjecture by Thurston asserts that any almost-Fuchsian manifold admits a foliation by constant mean curvature (CMC) surfaces. In this talk, I will describe a result from an upcoming joint work with Nguyen, Seppi, and Schlenker, where we describe explicit conditions of the first and second fundamental forms of the minimal surface of an almost-Fuchsian manifold that guarantee the existence of a CMC foliation.

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