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Aspherical manifolds that cannot be triangulated.

Kirby and Siebenmann showed that there are manifolds that do not admit PL structures, and yet the possibility remained that all manifolds could be triangulated. Freedman showed that there are 4-manifolds that cannot be triangulated. Davis and Januszkiewicz applied a hyperbolization procedure to Freedman's 4-manifolds to get closed aspherical 4-manifolds that cannot be triangulated. But what about higher dimensions?

In the late 1970s, Galewski and Stern and independently, Matumoto, showed that non-triangulable manifolds exist in all dimensions > 4 if and only if homology 3-spheres with certain properties do not exist. Manolescu showed that there were no such homology 3-spheres, and hence non-triangulable manifolds exist in every dimension > 4 .

By carefully applying a hyperbolization technique to the Galewski-Stern examples, we show, for all $n \geq 6$, that there exists a closed aspherical n -manifold which cannot be triangulated. (Received January 27, 2014)