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)