Hyperbolic-by-hyberbolic hyperbolic groups

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Mosher gave the first examples of hyperbolic-by-hyperbolic hyperbolic groups where all of the groups involved are non-elementary. His examples were surface-by-free groups and were the kernel of the theory of convex cocompact subgroups of the mapping class group later developed by Farb and Mosher. Work of Farb-Mosher and Hamenstaedt shows that a surface group extension is hyperbolic if and only if the base group is convex cocompact. I will discuss joint work with Bestvina, Bromberg, and Leininger giving a new characterization of hyperbolicity of such extensions.