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## Hyperbolic and relatively hyperbolic groups with 2-sphere boundary.

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We define a “drilling” of a hyperbolic group along a maximal infinite cyclic subgroup, which results in a relatively hyperbolic group pair. This procedure is inspired by drilling a hyperbolic 3-manifold along an embedded geodesic. We show that, under suitable circumstances, drilling a hyperbolic group with 2-sphere hyperbolic boundary results in a relatively hyperbolic group with 2-sphere relatively hyperbolic boundary. This is joint work with D. Groves, P. Haissinsky, D. Osajda, and A. Sisto. If time permits, I will discuss a somewhat related result with E. Stark which implies that a hyperbolic space which admits a geometric action and admits a relatively hyperbolic action with rank 2 abelian peripheral subgroups is quasi-isometric to  $\mathbb{H}^3$ .

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