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Fibrations and polynomial invariants for free-by-cyclic groups

The beautiful theory developed by Thurston, Fried and McMullen provides a near complete picture of the various ways a hyperbolic 3–manifold M can fiber over the circle. Namely, there are distinguished convex cones in the first cohomology $H^1(M;\mathbb{R})$ whose integral points all correspond to fibrations of M, and the dynamical features of these fibrations are all encoded by McMullen's "Teichmüller polynomial."

This talk will describe recent work developing aspects of this picture in the setting of a free-by-cyclic group G. Specifically, I will introduce a polynomial invariant that determines a convex polygonal cone $\mathcal{C}$ in the first cohomology of G whose integral points all correspond to algebraically interesting splittings of G. The polynomial invariant additionally provides a wealth of dynamical information about these splittings. This is joint work with Ilya Kapovich and Christopher J. Leininger.