

## **Hyperbolicity in Outer space and free group extensions**

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The first aspects of hyperbolicity in Outer space were discovered by Algom-Kfir, who showed that axes of fully irreducible automorphisms are strongly contracting. In this talk I will present a characterization of this strongly contracting property in terms of the geodesic's projection to the free factor complex. This characterization allows one to exploit the hyperbolicity of Outer space to study many geometric aspects of free group extensions. Results here include a flexible means of producing hyperbolic free group extensions, qualitative statements regarding their structure and quasiconvex subgroups, and quantitative results about their Cannon-Thurston maps.

Mostly joint with Sam Taylor, and some joint with Ilya Kapovich and Sam Taylor.