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*An explicit relationship between the ghost and swapping algebras*

The notion of an Anosov representation is based on dynamical properties of discrete and faithful representations of a surface group into a semi-simple Lie group  $G$ , up to conjugation. Anosov representations were developed by Labourie and have been used to investigate moduli spaces of higher rank geometric structures on manifolds, themselves open subsets, known as Hitchin components, of associated character varieties. Fundamental for studying moduli spaces of Anosov representations are natural classes of functions that generalize trace functions and length functions when  $G$  is  $PLS(2, R)$ . Examples of such functions are “length functions” associated to geodesic currents developed by Bonahon-Dreyer, “correlation functions” developed Bridgeman-Canary-Labourie and further generalized to “projectors” in the context of “uniformly hyperbolic bundles” by Bridgeman-Labourie.

In this talk we rapidly review the work of Bridgeman-Labourie which relates several major results, namely: the symplectic geometry of character varieties (Goldman), to the notions of positivity and cluster algebra coordinates (Fock-Goncharov and Bonahon-Dreyer), and also the “swapping algebra” (Labourie). The main result of our talk is a description of an explicit Lie algebra isomorphism between the “ghost algebra” (Bridgeman-Labourie) and the “swapping algebra” (Labourie) for projective-Anosov representations.

This is joint work with Ming Hong Tee.