

Projective Geometry, Dark Matter Halos, and Supermassive Black Holes

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The Thomas-Whitehead projective gravity theory has its origins in string theory. There is an identified correspondence between the coadjoint elements of the Virasoro algebra and Sturm-Liouville operators. This identification of the projective structure in one dimension allows for relating the Virasoro algebra and projective geometry in higher dimensions. The coadjoint orbits of Virasoro algebra promote the existence of an associated “gauge” field, the diffeomorphism field D . We’ve examined how the Thomas Whitehead projective connection can be used to form a curvature tensor, that is then used to build an action for Thomas Whitehead projective gravity. The fields Π and D of the Thomas-Whitehead connection source gravitation through an associated energy momentum tensor.

The Π and Diffeomorphism fields may provide a source for the supermassive black hole; additionally they should modify the Schwarzschild and Kerr solutions for their respective symmetries. We propose to investigate this possibility the energy momentum tensor contributions from the emanated Π and D fields corresponding to supermassive black hole solutions could supply the dark matter contribution to galaxy rotation curves.

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