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From Diffeomorphisms to Dark Matter

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One of the symmetries of string theory is encoded in the Virasoro algebra. String field theory is a representation of this algebra. The coadjoint representation of the Virasoro algebra together with the algebra related to one dimensional gauge transformations, viz the affine Lie algebras, can augment theories of gravitation based on geometry such as general relativity, to produce a natural setting for a field theory that can be used as a dark energy or dark matter candidate. We discuss and explore how this might be done and how recent cosmology experiments constrain this possibility.