

## Differential geometry of free loop spaces

String theory predicts the existence of a "Dirac-Ramond operator" on the free loop space of a finite dimensional manifold and furthermore indicates that its rotationequivariant index should be a modular form, closely related to elliptic genera. In this talk we will survey the direct approach to Dirac operators on loop spaces, going from infinite dimensional multilinear algebra and topological foundations to twistor methods and analytic calculations.

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