Nonlocal Equations in String Theory and Sobolev Spaces on Locally Compact Abelian Groups

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In this talk I will present a rigorous analytic approach to the study of nonlocal equations (or, "equations in infinitely many derivatives") of interest for string theory and cosmology. In particular, I will present results on the existence of regular solutions to the generalized bosonic string equation (which involves the exponential of the Laplace operator) in Euclidean space and also in compact Riemannian manifolds. Furthermore, I will describe a recent approach to Sobolev spaces on locally compact abelian groups and I will show how this approach can be used to investigate nonlocal equations in this general context.