Why Charged Massive Spin-3/2 Fields Want to Be String Oscillator States

Karim Benakli*[1]

[1]LPTHE - CNRS - Sorbonne Université – LPTHE, CNRS, Sorbonne Université – France

Abstract

Massive charged higher-spin fields, already for spin 3/2 and spin 2, face well-known consistency problems in electromagnetic and gravitational backgrounds, including acausal propagation and inconsistent equations of motion. I will review these obstructions, explain why they remained difficult to overcome for decades, and describe recent progress in constructing effective equations for massive charged spin-3/2 fields in external electromagnetic backgrounds. I will then discuss how coupling to gravity imposes particularly strong restrictions, and argue that string theory, through the structure of its massive oscillator levels, provides a natural framework for understanding the consistency of such interactions.

*Speaker