Конференц-зал ФИАН

29 ноября (вторник), в 15-00

Обзорная лекция

"Massless elementary particles with continuous spin: Wigner's exotic representation of the Poincare group"

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Particles of "continuous" (or, rather, infinite) spin are massless fields with infinitely many degrees of freedom per spacetime point, described by exotic unitary irreducible representations of the Poincare group appearing in Wigner's classification. The infortunate terminology "continuous spin" comes from the fact that, although these fields are massless and propagate in flat spacetime, they are labeled by a continuous dimensionful parameter. This surprising property is often taken as a motive for rejection. However, it has recently been suggested that it might allow them to circumvent Weinberg's soft theorems preventing the existence of long-range interactions mediated by particles of helicity greater than two in flat spacetime, via a mechanism similar to what happens in the presence of a cosmological constant. Accordingly, it has been speculated that they might possibly be related to some subtle flat limit of higher-spin gravity, since both spectra coincide at free level. We will review old mathematical results (Wigner's group-theoretical description) as well as new results (covariant Lagrangians, infinite-spin limit of massive particles, etc) about these exotic fields. We will conclude with a list of open problems which remain to be explored in order to clarify the status of the previous suggestive scenarios.

Цикл приглашенных лекций ФИАН

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