

SPIN & GEOMETRY

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Abstract

The double analogy of Fermi-Riemann----Bose-Lobachevsky revealed

The spin of elementary particle is a certain inner moment which it made impossible to imagine real picture.

Spin visual picture is absent.

Was noticed analogy concerning the geometrical interpretation of spin.

According Pauli principle the two identical particles with half-integral spin (fermions) cannot be simultaneously in the same quantum state.

The alternative of Pauli principle maintains that in one and the same quantum state infinitely number of particles (bosons) with integral spin could be found. Thus, the two similar fermions can't be found in the same space point.

The remarkable situation: when in one case in one and the same place of space one can't put more than one particle and in the other-ininitely much, which gives a hint that spin has a some geometrical sense.

To speak in images the spin in one case creates very "tight", and in the other case - very "spacious" space. To this question we cannot now give an answer which necessity to find an answer in the geometrical notions.

That's why we proceed to the geometry and reminding some situation with fermions and bosons.

Besides the Euclidean geometry there are other geometrical systems (Lobachevsky, Riemannian geometry). According to Klein's interpretation, which is based on the projective geometry, the Euclidean, Lobachevsky and Riemannian geometry's are in the unified scheme. The most known indication to identify the latter two geometry is:

In the Riemannian geometry (elliptical) across given point can't draw a straight line which couldn't cross the given straight line (analogy with the fermions). In the Lobachevsky geometry (hyperbolic) across every point infinite set of straight lines is passing, not intersecting with the given hyperbolic straight line (analogy with bosons).

Is that sign of elementary particles pointing out to its non-Euclidean nature?

Is the zero curvature of space develops from total positive and negative curvatures of spaces created by fermions and bosons?

Is a key to understand "the space foam"?

Reference [1] attempts to apply this double analogy.

Above mentioned briefly:

Geometry elliptical ("parallel")	Zero	Physics fermions	Particles Zero
Geometry hyperbolic ("parallel")	Infinity	Physics bosons	Particles Infinity

Reference

1. <https://vixra.org/abs/0907.0008>