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Cosmology in Terms of Wave Geometry (IX) Theory of Spiral Nebulae.

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§ 1. General outline and summary.

General outline: Though several authors[1] have attempted to explain the structure of spiral nebulae, no theory yet, so far as we know, is generally admitted to be satisfactory.

The purpose of this paper is, on a basis of wave geometry, to try to establish a theory concerning the structure of spiral nebulae in a quite natural way. The general outline of the research is as follows:

1. From the fact[2] that cosmology in terms of wave geometry is an invariant theory characterised by a group of transformations which are classified in two subgroups; the one (say G_4) is composed of transformations which make a spatial point (it may be any point) invariant, the other (say G_6) of transformations by which the new origin of coordinates is in a motion relative to the old system of coordinates such that the motion exactly satisfies Habble's velocity-distance relation in terms of wave geometrical cosmology, if we obtain a wave geometry which is invariant for the subgroup G_4, it may be regarded as representing a certain physical phenomenon with local irregularity around the fixed point, representing a general stellar existence with a centre.

2. In the expression of the stellar existence obtained as above, we put some restrictions which seem appropriate in characterising spiral nebulae.

3. From the fundamental equation for ψ, as above obtained, solving the actual value of ψ, constructing the particle momentum-density vector $u^i=\psi^\dagger A\gamma^i\psi$, and regarding this u^i as giving the flux and distribution of matter constituting a spiral nebula, we show that our theory successfully explains the actual construction of spiral nebulae.

Summary: In finding the fundamental differential equation for ψ which

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(2) T. Sibata, this Journal, **11** (1941), 21.