A Special Geometry – and its Consequences

Ulrich E. Bruchholz

E-mail: Ulrich.Bruchholz@t-online.de

Abstract

It is explained why the geometry of space-time, first found by RAINICH, is generally valid. The equations of this geometry, the known EINSTEIN-MAXWELL equations, are discussed, and results are listed. We shall see how these tensor equations can be solved. As well, neutrosophics is more supported than dialectics. We shall find even more categories than described in neutrosophics.

Keywords: Riemannian geometry, Relativity theory, Geometric theory of fields, Rainich theory, Tensor equations, Neutrosophics, Deterministic chaos.

First, we have to take notice of two facts:

1) All geometric quantities are tensors, and

2) all physical quantities are tensors.

This enforces the conclusion that all physics is pure geometry, and all fields in vacuo can be described by tensor equations. EINSTEIN and GROSSMANN found the field law of gravitation [1], and RAINICH [2, 3] included electromagnetism in the field law. As well, RAINICH did not dare omitting the sources, i.e. distributed charges and currents, and positioned his geometry as special case without sources. The sources (even also distributed masses in EINSTEIN's equations) are violating the BIANCHI identities [4] in the tensor equations. This is synonymous with the violation of conservation of energy and momentum. All this is explained in detail in [5].

The commonly accepted methods introduced for saving the conservation theorems and for describing the omnipresent quantization are pooled in the standard model. However, the standard model has come to its limits. So it is impossible to predict masses of particles. Also, the purely philosophical term of dialectics is declared as property of nature. For example, the known double-slit experiments would allegedly prove the dialectic nature. Here, we have a typical case of bad observation. AFSHAR demonstrated the clear wave character of light [6], and AL RABEH numerically simulated a double-slit system with point charges (repeated by ECKARDT and BRUCHHOLZ [7]), where the same interference patterns appear as from waves. The calamity of the standard model is accurately expressed by EVANS [9]:

Attempts at unification using the standard model are well known to be riddled with unknowns and unobservables, a theory that Pauli would have described as "not even wrong", meaning that it cannot be tested experimentally and is non Baconian.

A step to the right direction is the ECE theory [8, 9]. EVANS, ECKARDT et al. believe that [9]

One of the major advantages of ECE 2 over MH (MAXWELL-HEAVISIDE) *is that in the former theory the magnetic and electric charge current densities are defined geometrically. In ECE 2, the field equations of gravitation, fluid dynamics and the weak and strong nuclear forces have the same format precisely as the field equations of electrodynamics, so it is clear that unification of the four fundamental fields, and also of fluid dynamics, has been achieved for the first time in the history of physics.*

As well, EVANS et al. mean an extension of RIEMANNian geometry by torsion. Their theory is purely based on axioms, and the structure of the vacuum for example can be described by fluid dynamics, delivering the well known vacuum effects like the anomalous g factor and the LAMB shift of atoms [9]. The "weak and strong forces" are man-made terms of the standard model, and no physically existing fields at all. This approach is an interesting try to describe the man-made and non-linear terms by a theory which is linear on the uppermost level (MAXWELL-like force equations) but non-linear in the underlying tensor structure of spacetime. (See [9].)

In order to overcome the calamities with the sources like distributed masses and charges, one needs radical approaches, that means cancelling any sources. Using this step, the geometry remains RIEMANNian [11]. First approximations of the field equations are wave equations. Non-zero solutions come from integration constants of these wave equations. The BIANCHI identities are fulfilled, what means that the system of partial differential equations is under-determined. So we get a set of many solutions, dependent on arbitrary additional conditions, but the integration constants do not change with the additional conditions ! – The integration constants are identical with particle quantities, i.e. mass, spin, charge, magnetic moment, see [10, 5].

Solving the geometric equations, the "covariant" EINSTEIN-MAXWELL equations, might be fairly difficult. However, we can use sampling methods, going from known geometrical regions through unknown regions up to a geometric limit step by step. (With the geometric limit, a singularity problem does not exist [5].) As well, there are initial conditions, which are solutions of the associated wave equations. The integration constants are parameters being inserted into the wave solutions. The mentioned geometric limit performs a margin leading to discrete values of the integration constants ! One can numerically determine these discrete values by means of lots of tests. – This all is explained in detail in [5]. Also results are presented there. These results differ from known values (of electron, nuclei) by no more than 5%. The differences may be a lot, however, the plenty of values means excellent sureness of facts. Moreover, masses of supposed neutrinos are predicted [5].

The step-by-step numerical calculation of the geometric equations leads to sequences of the form

$$f_{n+2} = 2f_n - f_{n-2} - (2\,\Delta x)^2 F_n(c_\nu) \quad .$$

f_{n+2} is the new value of f being determined at the place x_{n+2}. F_n is a function of previously determined quantities f_n, f_{n-1}, f_{n+1}, and constants c_ν, which act as parameters. Such sequences effectuate chaos like that first found by MANDELBROT, for example [12]. The stability of the particular solution depends on the parameters. The solution is maximally stable just where the above mentioned discrete parameters take the values realized in physics.

Solving geometric equations resp. non-linear field equations, we have four cases:

1) and 2) True and False (determinacy), where wave equations are dominant. The integration constants come from the wave equations.

3) Indeterminacy due to the under-determinacy of the equations. This appears where non-linearity becomes effective, and has no influence to the integration constants.

4) Deterministic Chaos. It determines the discrete values of the integration constants.

We have chaos everywhere in nature [12], therefore we must not neglect it. It should provide categorical discussions just in Neutrosophics.

References

[1] A. EINSTEIN,
Grundzüge der Relativitätstheorie (A back-translation from the Four Lectures on Theory of Relativity).
Akademie-Verlag Berlin, Pergamon Press Oxford, Friedrich Vieweg & Sohn Braunschweig (1969).

[2] G. Y. RAINICH,
Electrodynamics in the General Relativity Theory.
Proc. N.A.S., **10** (1924), 124-127.

[3] G. Y. RAINICH,
Second Note Electrodynamics in the General Relativity Theory.
Proc. N.A.S., **10** (1924), 294-298.

[4] L. P. EISENHART,
Riemannian Geometry.
Princeton university press (1949).

[5] U. E. BRUCHHOLZ,
Quanta and Particles as Necessary Consequence of General Relativity.
LAP LAMBERT Academic Publishing (2017),
ISBN: 978-620-2-07669-2.

[6] S. S. AFSHAR et al.,
Paradox in Wave-Particle Duality.
arXiv:quantph/0702188 (2007).

[7] H. ECKARDT and U. E. BRUCHHOLZ,
Quantum Particle Diffraction by a Classical Method.
Adv. Studies Theor. Phys., **6** no.1 (2012), 9-17.
Online available: http://www.m-hikari.com/astp/

[8] M. W. EVANS et al.,
PRINCIPLES OF ECE THEORY A NEW PARADIGM OF PHYSICS.
New Generation Publishing (2016),
ISBN-13: 978-1787191808.

[9] M. W. EVANS, H. ECKARDT et al.,
PRINCIPLES OF ECE THEORY VOLUME 2: CLOSING THE GAP BETWEEN EXPERIMENT AND THEORY.
epubli, Berlin (2017),
ISBN: 978-3-7450-1326-9.

[10] U. E. BRUCHHOLZ,
Key Notes on a Geometric Theory of Fields.
Progress in Physics, **5** (2) (2009), 107-113.
http://www.ptep-online.com/index_files/2009/PP-17-17.PDF

[11] U. E. BRUCHHOLZ,
Geometry of Space-Time.
Progress in Physics, **5** (4) (2009), 65-66.
http://www.ptep-online.com/index_files/2009/PP-19-06.PDF

[12] J. GLEICK,
Chaos, die Ordnung des Universums. Vorstoß in Grenzbereiche der modernen Physik.
(Engl. orig.: Chaos. Making a new science.)
Droemer Knaur München (1990),
ISBN: 3-426-04078-6.