Alpha Institute for Advanced Studies (AIAS)

UBI MATERIA, IBI GEOMETRIA.

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WO MATERIE IST, DORT IST GEOMETRIE.

WHERE THERE IS MATTER, THERE IS GEOMETRY.

A Brief Introduction to ECE Theory

Any historical account of modern developments in physics must include Einstein's geometrical concept, which was the first paradigm shift in physics since Newton introduced his laws of motion, more than two hundred years before. Attempts at experimental validation of Einstein's general relativity have been rare, and have mainly concerned the Solar System, like the deflection of light by the Sun and the precession of the orbit of Mercury. In spite of this limitation, the theory was taken as a basis for cosmology, from which the Big Bang and dark matter were later extrapolated.

Unfortunately, this approach to cosmology has introduced self-contradictory inconsistencies. For example, the concept that the speed of light is an absolute upper limit is incompatible with the fact that, to explain the first expansive phase of the universe, one has to assume that this happened with an expansion velocity faster than the speed of light. This example is only one of the criticisms of Einstein that have yet to be answered properly and scientifically.

Later, after Einstein's death, the velocity curve of galaxies was observed by astronomers. They observed that stars in the outer arms of galaxies do not move according to Newton's law of gravitation, but have a constant velocity. However, Einstein's theory of general relativity is not able to explain this behavior. Both of these theories break down in cosmic dimensions, and when a theory does not

match experimental data, the scientific method requires that the theory be improved or replaced with a better concept.

In the case of galactic velocity curves, however, it was “decided” that Einstein was right and that there had to be another reason why stars behave in this way. Dark matter that interacts through gravity and is distributed in a way that accounts for observed orbits was then postulated. Despite an intensive search for dark matter, even on the sub-atomic level, nothing has been found that could interact with ordinary matter through gravity, but not interact with observable electromagnetic radiation, such as light.

Although Einstein’s theory has become increasingly problematic, the scientific community has been reluctant to abandon it. Starting around 2001, the members of the AIAS institute, with Myron Evans as the guiding researcher, developed a new theory of physics, Einstein-Cartan-Evans (ECE) theory, which overcomes the problems in Einstein’s general relativity. They were even able to unify this new theory with electrodynamics and quantum mechanics. This enabled significant progress in several fields of physics, and the most important aspects are described in the ECE textbooks (available as ECE/UFT Papers 438 and 448).

ECE theory is based entirely on geometry, as was Einstein’s general theory of relativity. Therefore, Einstein is included in the name of this new theoretical approach. Both theories take the geometry of spacetime (three space dimensions, plus one time dimension) as their basis. While Einstein thought that matter curves spacetime and assumed matter to be a “source” of fields, ECE theory is based entirely on the field concept and does not need to introduce external sources.

This idea of sources created a number of difficulties in Einstein’s theory. Another reason for these difficulties is that Einstein made an unavoidable but significant mathematical error in his original theory (1905 to 1915), because all of the necessary information was not yet available.

Riemann inferred the metric around 1850, and Christoffel inferred the connection around the 1860s. The idea of curvature was introduced at the beginning of the twentieth century, by Levi-Civita, Ricci, Bianchi and colleagues in Pisa. However, the concept of torsion was not fully developed until the early 1920s, when Cartan and Maurer introduced the first structure equation. Therefore, in 1915, when Einstein published his field equation, Riemann geometry did not include torsion, and there was no way of determining that the Christoffel connection must be antisymmetric. The connection was assumed to be symmetric (probably for ease of calculation), and the inferences of Einstein’s theory ended up being based on incorrect geometry.

Setting torsion to zero and using a symmetric connection leads to a contradiction with significant consequences, as has been shown by the AIAS Institute. For details, please see the book Criticisms of the Einstein Field Equation (ECE/UFT Paper 301, 548 pages, 2010).

Torsion (which is a twisting of space) turns out to be essential and inextricably linked to curvature, because if the torsion is zero then the curvature vanishes. In fact, torsion is even more important than curvature, because the unified laws of gravitation and electrodynamics are basically physical interpretations of twisting, which is formally described by the torsion tensor. ECE theory unifies physics by deriving all of it directly and deterministically from Cartan geometry, and does so without using adjustable parameters in the foundational axioms. The parameters that combine geometry with physics are derived from experimental data and are thus not arbitrarily adjustable. Spacetime is completely specified by curvature and torsion, and ECE theory uses these underlying fundamental qualities to derive all of physics from differential geometry, and to predict quantum effects without assuming them (as postulates) from the beginning. It is the first (and only) generally covariant, objective and causal unified field theory.

Instead of using Einstein's field equation, ECE theory uses the equations of Cartan geometry, which can be written in a form equivalent to Maxwell's equations, for electrodynamics as well as for gravitation. By comparing this form of the Cartan equations with Maxwell's original equations (which include charges and currents), one can define charge and current terms that consist of field terms combined with curvature and torsion terms. The same can be done for gravitation, and this allows unification to happen via geometry. If a charge is present, we have electromagnetism, if not, we have only gravitation.

In ECE theory, there are no sources a priori, only fields. Matter is considered to be a "condensed field" of general relativity, and spacetime itself may be interpreted as a vacuum or aether field that exists everywhere. Matter as condensed fields leads directly to quantum mechanics, and avoids extra concepts like quantum electrodynamics.

The same equations hold for electrodynamics, gravitation, mechanics and fluid dynamics, which places all of classical physics on common ground. Physics is extended to the microscopic level by introducing canonical quantization and quantum geometry. The quantum statistics that is used is classically deterministic, because the Heisenberg uncertainty principle has been shown to not be valid for all combinations of conjugated operators. Also, there is no need for renormalization and quantum electrodynamics, because of the intrinsic qualities of ECE quantum mechanics. All known effects, up to and including the structure of the vacuum, can be explained within the ECE axioms, which are based on Cartan geometry.

Vacuum forces give rise to microscopic effects like the Lamb shift and vacuum fluctuations. ECE m- theory, when applied to quantum mechanics, leads to a unification of this subject with general relativity, and enables new derived methodologies like a quantum force and quantum-Hamilton equations. Consequently, quantum mechanics has become a simpler and better understood subject.

The following two categorizations are provided as possible starting points for exploration of ECE theory.

Important achievements of ECE theory include:

- Refutation of the Einstein field equation, big bang and black hole theory.
- Discovery of the antisymmetry laws of electrodynamics and gravitation.
- Replacement of the Einstein de Broglie equations by R theory.
- Development of the first single particle fermion equation that is based only on the Pauli spin matrices.
- Refutation of the dogma of negative energy in quantum field theory.
- Demonstration that energy from spacetime does not violate conservation laws of physics.
- Refutation of the Heisenberg uncertainty principle.
- Discovery of the quantum Hamilton equations.
- Discovery of the quantum force equation and pure quantum force.
- Discovery of spin connection resonance in the laws of nature. (By creating enabling conditions for spin connection resonance, new physics effects can be engineered.)

Physical phenomena that can now be explained using ECE theory include:

- The spiral shape of galaxies (with stars on hyperbolic paths in spiral arms), and without the need for "dark matter".
- Large-scale motion of mass jets from the center of galaxies back to the outer edge of the disk.
- Explanation of star motion by generally-relativistic extensions of Lagrange and Hamilton dynamics.
- The Hubble red shift of light from distant galaxies.
- Why the Michelson/Morley experiment did not detect an "aether". [[pending clarification]]
- Why ring laser gyros would need aether to function. (The ring laser gyro is the Sagnac effect that is explained by the vector potential of rotation.)
- The quantum mechanical Lamb shift as a vacuum effect.
- Vacuum fluctuations as the origin of orbital precession.
- Spacetime as a potential source of energy (for example, by spin connection resonance).
- Explanation of Low Energy Nuclear Reactions (LENR) as an effect of general relativity.

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