

## **Introduction:- The Completion of Einstein's Work.**

As far back as the seventeenth century, Galileo was thinking about problems raised by relativity with respect to two observers watching the same event. He considered how the path of a ball, falling from the mast of a ship as it was leaving harbor, would look to a person on the ship and an observer on the shore. He concluded that the ball would appear to fall vertically down to the person on the ship, but show a sideways motion, related to the ship's speed to the observer on land.

In the nineteenth century scientists and mathematicians in a number of countries began pondering the effects of relativity on objects and observers traveling at high speed. As the century progressed, the importance of this strange area of physics was becoming clearer. James Clerk Maxwell produced equations showing light always moved away at the speed of light irrespective of the speed of an observer and in 1887 Michelson and Morley proved experimentally, that this was the case. George Fitzgerald working at Trinity College, Dublin suggested that at high speeds, close to the speed of light distance contracted and this explained what Maxwell, Michelson and Morley had found. Oliver Heaviside's experiments with electricity were confirming this and Lorentz produced a formula which could be used to calculate the degree of this contraction.

At the turn of the twentieth century, building on the work of these nineteenth century scientists and mathematicians, Einstein was able to formulate his great theory of special relativity. Einstein later extended special relativity (which describes how objects behave at speeds close to the speed of light), to general relativity which includes the effects of gravity on the motion of objects. Special relativity combined with general relativity, has been described by some, as the crowning achievement of nineteenth century physics.

Also, at the turn of the twentieth century, Einstein together with Planck started the quantum theory revolution. Quantum theory described light in terms of a wave particle duality and enabled Bohr to describe how electrons behaved inside atoms. Quantum theory went on to be considered by many to be the most important theory of the twentieth century. However, Einstein came to have reservations about quantum theory, believing it to be incomplete.

By the time of the 1927 Solvay conference Bohr, Heisenberg and Pauli were convinced that an acausal indeterminacy, held sway at the atomic level and Heisenberg's uncertainty principle was being accepted as the way forward in physics, as the so called Copenhagen convention. Einstein did not accept this however and worked until 1955 trying to combine electromagnetism with relativity to prove nature was after all deterministic. Einstein subsequently went down in history as wasting the last thirty years of his life on a hopeless venture, and that was that! Or was it?

As it turns out Einstein did not work in isolation as is commonly believed, but was supported in various ways by a team of superb scientists. Through them, Einstein's work continued away from the public eye and with time their theories have resurfaced. The subjective and acausal indeterminacy of Bohr and Heisenberg has also been proven false by experimentation, and these concepts are also extrinsic to objective and causal relativity - the great twentieth century debate in physics: causal deterministic (Planck, Einstein, de Broglie, Schrödinger, Bohm, Vigier and followers) versus Copenhagen (Bohr, Heisenberg, Pauli and followers). ECE theory shows that the causal deterministic school was correct after all!

ECE theory is short for Einstein-Cartan-Evans theory. Einstein showed that space was curved, while at the same time Elie Cartan, the great French mathematician, was attempting to show that electromagnetism was spinning spacetime or torsion. Myron Evans was able to 'dock' the two theories and in so doing completed Einstein's great work. ECE theory describes the standard model in terms of geometry. For each force there is a specific curvature of spacetime geometry and the equations which describe this geometry can be applied to any area of science. Thus, ECE theory could soon become recognized as the crowning achievement of the twenty first century.

In **1998**, the international think tank the **Alpha Institute for Advanced Study (AIAS)** was set up to promote ECE theory and now comprises physicists, engineers and scientists from all over the world. ECE theory is a generally covariant unified field theory describing all of physics through geometry. ECE theory is simpler, yet more powerful than the standard model currently used in physics. The table below shows that ECE theory overcomes many theoretical problems encountered by the standard model and also describes experimental evidence in a far more convincing way.

The table shows ECE theory is a milestone in the development of theoretical physics. It shows lucidly that physics has now moved on from a viewpoint of the fundamentals, with ECE theory opening up the way for new advances in our understanding of the natural world and providing opportunities for technological breakthroughs. ECE theory is already being used to research and develop new technologies in the fields of motors, generators, instrumental chemical analysis, medical scanners and even antigravity devices.

## Table of Differences between the Standard Model and ECE

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ECE	Standard Model
All fields are objective, causal and generally covariant in both classical and quantum manifestations.	Only gravity is generally covariant, causal and objective and only in its classical limit
Torsion is considered	Neglects torsion
Quantum mechanics is objective and causal, just like gravity	Quantum mechanics and gravity cannot be unified.
Electrodynamics and gravity are two geometrical aspects of space-time, the former being torsion- and the latter curvature.	Electrodynamics and gravity are philosophically different.
No concepts, which have been disproven experimentally, are used. For example, Heisenberg Uncertainty Principle, strings, superstrings, Higgs mechanism, renormalization, asymptotic freedom, spontaneous symmetry breaking, dark matter, singularities such as the Big Bang and black hole theory and abstract internal space of Yang Mills gauge theory.	Contains several concepts which are experimentally unproven and/or do not exist in relativity theory.
Quantum electrodynamics is developed from simultaneous ECE wave equations and is generally covariant objective and causal.	Hugely over-elaborate and contains adjustable parameters.
All the wave equations are generally covariant, are derived from the tetrad postulate of geometry, and all are objective and causal.	Wave equations of physics such as the Dirac and Proca equations are postulates of special relativity unrelated to geometry, objectivity and causality
Photon mass and the Proca equation are derived geometrically	Photon mass is asserted to be zero, causing problems of several kinds
Inter-relation of fields is geometrical and can be developed relatively easily.	The inter-relation of fields cannot be developed.
Derives all of physics geometrically from two basic postulates	Cannot describe all of physics geometrically

In 1916 general relativity came of age, with the publication of the famous Einstein Hilbert field equation. This equation is covariant under any type of coordinate transformation, and is therefore said to be generally covariant. However this equation is restricted to gravitational theory. In order to develop it into a unified theory for all fields of physics, consideration of the Cartan torsion was needed.

In the early twenties, Elie Cartan suggested to Einstein that electromagnetic radiation was due to the torsion or twisting of spacetime. They corresponded extensively on the subject but were not able to construct the required unified field theory. In 1992, one hundred years after George Fitzgerald had recognized that length contracted as speeds close to that of light were encountered; M. W. Evans inferred the spin field of electromagnetism from the inverse Faraday Effect, the phenomenon of magnetization by a circularly polarized electromagnetic field.

The spin field was subsequently developed into a form of electrodynamics that could incorporate the spin field self-consistently (" $O(3)$  electrodynamics"). The great Maxwell Heaviside theory was unable to do this because it is Lorentz covariant, but not generally covariant as required to unify fields logically within general relativity.

In the Spring of 2003, the field equations of gravitation and electromagnetism were unified into the Einstein Cartan Evans (ECE) field theory, which is based directly on Cartan (or differential) geometry. Shortly thereafter, the equations of the weak and strong fields were also unified with those of gravitation and electromagnetism, and the Dirac equation derived from the ECE wave equation. The equations of quantum mechanics and general relativity were unified in the same year (2003) through the use of the **tetrad postulate** of Cartan geometry, leading to the ECE Lemma and wave equation.

ECE theory has now been extensively developed in over a hundred scientific papers collected into a multi - volume monograph: M. W. Evans, "Generally Covariant Unified Field Theory" (Abramis, 2005 onwards), with six volumes published to date ([www.aias.us](http://www.aias.us) and [www.atomicprecision.com](http://www.atomicprecision.com)).

**All the wave equations and first order differential equations of physics, come from the tetrad postulate, and the field equations from the Bianchi identity.**

1905 was Einstein's 'miracle year'. In this year Einstein had five short papers published which changed the face of physics. One paper was special relativity, another paper put quantum theory on a firm footing and the last paper introduced the world to his famous equation  $E = mc^2$ . Physics previous to these insights can be referred to as classical physics and later developments can be referred to as quantum physics or quantum chemistry.

Nearly one hundred years later, 2003 became Myron Evan's 'miracle' year. In this year Evans finally achieved what Einstein had endeavored to do from 1927 to the day he died, namely the unification of gravitation (general relativity) with electromagnetism. Evan's then unified the weak and strong nuclear forces with gravitation and electromagnetism. He then went on to derive the famous Dirac equation from first principles using his ECE theory. This allowed quantum theory to be united with special relativity, as was achieved last century, when the new subject area of quantum electrodynamics (QED) came into existence. Finally, Evans surpassed himself by unifying the equations of quantum electrodynamics with general relativity, thereby simplifying quantum electrodynamics (QED) and banishing forever some of the outlandish baggage which had become associated with quantum electrodynamics and which was interfering with the development of QED to the next level

In 1905 Einstein's ground breaking papers were greeted by silence. This was no doubt due to scientists being unable to take on board the scope and magnitude of Einstein's insights into physical problems of the day. Einstein had to carry on working as a patent officer in the Bern Patent Office for another five years, before the great Max Planck's assistant turned up at his workplace to end his isolation. From there Einstein became a professor of physics at the University of Zurich, before becoming a professor in Charles University, Prague and ultimately a professor in Berlin.

Myron's miracle year on the other hand did not go unnoticed, with the Swedish physicist Professor Bo Lehnert, quickly alerting the British establishment to what had been achieved. Evan's was quickly nominated as a worthy candidate for the Civil List and was supported by both The Royal Society and The Royal Society of Chemistry. Martin Caton, the M.P. for Gower supported Myron's nomination to the civil list and helped speed the process through. In 2005, one hundred years after Einstein's miraculous year, Evans' achievements were discussed in Parliament and MP's voted overwhelmingly to reward Myron's great achievements with an appointment to the civil list. Myron Evans is the only scientist in Britain or the Commonwealth on the Civil List and acknowledges his thanks for this award on all his new publications.

The Alpha Institute for Advanced Study (AIAS) had been formed in 1996 to promote work in the field of chemical physics. The first webmaster of [www.aias.us](http://www.aias.us) was Bob Grey of Rochester, New York who was followed by Sean MacLachlan of

Boise, Idaho. Myron Evans was elected Director of the Alpha Institute for Advanced Study in 1998. AIAS became a vital conduit for promoting Evan's unified field theories. By December, 2005 Lar Felker from Reno, Nevada in the United States and Horst Eckardt from Munich, Germany had collaborated to produce a short introductory article entitled,

'Einstein, Cartan, Evans – Start of a New Age in Physics?'

The article enabled interested parties worldwide; to get a flavor of the power and technological potential of Myron's new ECE unified field theory. The article became the most popular item on the [www.aias.us](http://www.aias.us) website and is now available in eight languages.

Lar Felker went on to write soon after, a textbook on ECE theory entitled, 'The Evans Equations of Unified Field Theory', This was available as a free download on [www.aias.us](http://www.aias.us) until May 2007, when it was published in print form by, Abramis Academic Publishing).

In 2006, A. D. DeBruhl had his book, 'The Ultimate Truth', Published in the United States. DeBruhl devotes a chapter of his book to ECE theory and on page 120 describes his view of the importance of Evan's miraculous year as,

***"Finally, over half a century after Einstein made his contributions of general and special relativity, Myron Evans, following in the tradition of Einstein, accomplished the impossible. Instead of trying to quantify gravity in terms of discrete packets of energy (quanta) to make it comply with the standard model, Evans took the opposite approach; He succeeded in describing the standard model in terms of geometry. In the Evans Grand Unified Field Theory particle exchange is not the fundamental unifying factor. Instead, for each force there is a specific curvature of spacetime or spacetime geometry. The resulting equations can be applied to any area of science and engineering. The impact on the computer, transportation, medical, power, and manufacturing industries will ultimately be as profound as the discovery of fire".***